ABBREVIATIONS

A/E	ARCHITECT / ENGINEER
AAHX	AIR TO AIR HEAT EXCHANGER
AB	AIR BLENDER
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCH	AIR COOLED CHILLER
ACCU	AIR-COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT
ACD	AUTOMATIC CONTROL DAMPER,MODULATING
ACD-TP	AUTOMATIC CONTROL DAMPER,TWO POSITION
AD	ACCESS DOOR
AF	AFTER FILTER
AFCV	AIR FLOW CONTROL VALVE
AFF	ABOVE FINISHED FLOOR
AFMD	AIR FLOW MEASURING DEVICE
AFW	AIR FOIL WHEEL (FAN)
AHU	AIR-HANDLING UNIT
AMP	AMPERGE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
AS	AIR SEPARATOR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AW	AIR WASHER
AXF	AXIAL FLOW
B	BOILER
BD	BUTTERFLY DAMPER
BDD	BACKDRAFT DAMPER
BDR	BASE BOARD RADIATOR
BFP	BACKFLOW PREVENTER
BFT	BOILER PLANT FIRE TUBE
BG	BOTTOM GRILLE
BHP	BRAKE HORSEPOWER
BHW	HOT WATER HEATING BOILER
BHX	BOILER BLOWDOWN HEAT EXCHANGER
BIW	BACKWARD INCLINED WHEEL (FAN)
BMT	BONE MARROW TRANSPLANT
BR	BOTTOM REGISTER
BSC	BIOLOGICAL SAFETY CABINETS
BT	BLOWOFF TANK
BTC	BLOWOFF TANK CONTROL VALVE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BWT	BOILER PLANT WATER TUBE
C	CENTIGRADE (CELCIUS)
CC	COOLING COIL
CCD	COOLING COIL CONDENSATE DRAIN
CD	CEILING DIFFUSER
CD-1	CONSTRUCTION DOCUMENTS (SUBMISSION1)
CD-2	CONSTRUCTION DOCUMENTS (SUBMISSION2)
CENT	CENTRIFICAL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFT	CUBIC FEET
CFP	CHEMICAL FEED PUMP
CG	CEILING GRILLE
CH	CHILLER
CHP	CHILLED WATER PUMP
CHW	CHILLER WATER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CI	CAST IRON
CM	CARBON MONOXIDE
CM	CUBIC METER
CM/S	CUBIC METER PER SECOND
CO	CLEAN OUT
CO2	CARBON DIOXODE
COMP	COMPRESSOR UNIT
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CR	CEILING REGISTER
CS	CONDENSATE STORAGE TANK
CSG	CLEAN STEAM GENERATOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
CW	COLD WATER (POTABLE)
CWCC	CHILLED WATER COOLING COIL
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN (TO COOLING TOWER)
CWS	CONDENSER WATER SUPPLY (FROM COOLING TOWER)
D	DAMPER - AUTOMATIC
D-1	OUTDOOR AIR DAMPER
D-2	RETURN AIR DAMPER
D-3	RELIEF AIR DAMPER
DB	DECIBELS
Db	DRY-BULB TEMPERATURE
DD-1	DESIGN DEVELOPMENT (SUBMISSION1)
DD-2	DESIGN DEVELOPMENT (SUBMISSION2)
DDC	DIRECT DIGITAL CONTROLS
DEG	DEGREE
DF	DIFFUSER
DIA	DIAMETER
DIW	DEIONIZED WATER
DP	DEW POINT TEMPERATURE
DP	DIFFUSER PLATE
DPA	DIFFERENTIAL PRESSURE ASSEMBLY
DPS	DIFFERENTIAL PRESSURE SENSOR
DX	DIRECT EXPANSION
DXCC	DIRECT EXPANSION COOLING COIL
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	EVAPORATIVE COOLER
ECC	ENGINEERING CONTROL CENTER
ECU	EVAPORATIVE CONDENSER UNIT
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EGS	EMERGENCY GAS SHUTOFF
EGT	ENTERING GLYCOL TEMPERATURE
EH	EXHAUST HOOD
EJ	EXPANSION JOINT
EMD	END OF MAIN DRIP (STEAM)
ENT	ENTERING
ER	EXHAUST REGISTER
ERC	ELECTRIC REHEAT COIL
ERP	ELECTRIC RADIANT PANEL
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETO	ETHYLENE OXIDE
EUH	ELECTRIC UNIT HEATER
EWC	EVAPORATIVE WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX.	EXISTING
F	FAHRENHEIT
F&T	FLOAT AND THERMOSTATIC
F/SDPR	COMBINATION FIRE SMOKE DAMPER
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT (4 PIPE)
FCUC	FAN COIL UNIT COOLING ONLY
FCUH	FAN COIL UNIT HEATING ONLY
FCW	FORWARD CURVED WHEEL (FAN)
FD	FLOOR DRAIN
FD	FIRE DAMPER
FF	FINAL FILTER
FHX	FLUE GAS/FEEDWATER HEAT EXCHANGER
FM	FLOW METER
FOP	FUEL OIL PUMP
FOT	FUEL OIL TANK
FOHX	FUEL OIL HEAT EXCHANGER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FPTU	FAN POWERED TERMINAL UNIT
FR	FLOOR REGISTER
FRP	FIBER REINFORCED POLYESTER
FS	FLOW SWITCH
FSTAT	FREEZESTAT
FT	FEET
FT-LB	FOOT-POUND
FTR	FIN TUBE RADIATION
FV	FACE VELOCITY
GA	GAUGE
GAL	GALLONS
GH	GRAVITY HOOD
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GS	GALVANIZED STEEL
H	HUMIDIFER
H&CW	HOT & COLD WATER
HAC	HOUSEKEEPING AID CLOSET
HB	HOSE BIBB
HC	HEATING COIL
HD	HEAD
HD	HOOD
HOA	HAND/OFF/AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HPDT	HIGH PRESSURE DRIP TRAP
HPR	HIGH PRESSURE RETURN (STEAM CONDENSATE)
HPS	HIGH PRESSURE SUPPLY (STEAM)
HRC	HEAT RECOVERY COIL
HRD	HEAT RECOVERY DEVICE
HRP	HYDRONIC RADIANT (CEILING) PANEL
HRW	HEAT RECOVERY WHEEL
HSTAT	HUMIDISTAT
HTM	HUMIDIFIER TERMINAL
HUM	HUMIDIFIER UNIT MOUNTED
HVU	HEATING AND VENTILATING UNIT
HW	HOT WATER
HWC	HOT WATER COIL
HWHC	HOT WATER HEATING COIL
HWP	HEATING HOT WATER PUMP
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
HWUH	HOT WATER UNIT HEATER
HVD	HOISTWAY VENT DAMPER
HX	HEAT EXCHANGER
HZ	HERTZ
I/O	INPUT/OUTPUT
IAQ	INDOOR AIR QUALITY
IBT	INVERTED BUCKET TRAP
ICF	IN-LINE CENTRIFUGAL FAN
ICU	INTENSIVE CARE UNIT
ID	INSIDE DIAMETER
IFB	INTEGRAL FACE AND BYPASS
IN	INCHES
IN HG	INCHES OF MERCURY
IN WC	INCH WATER COLUMN
IN WG	INCH WATER GAUGE
IN-LB	INCH-POUND
IPLV	INTERGRATED PART LOAD VALUE
IRH	INTRARED HEATER
IS	INSECT SCREEN
IU	INDUCTION UNIT
IV	INLET VANES
J	INTENTIALLY LEFT BLANK
kg	KILOGRAM
kg/HR	KILOGRAM PER HOUR
kPa	KILOPASCAL
kW	KILOWATT
kWh	KILOWATT HOUR
L	LITER
L/h	LITERS PER HOUR (OR LITERS/HOUR)
L/m	LITERS PER MINUTE (OR LITERS/MINUTE)
L/s	LITERS PER SECOND (OR LITERS/SECOND)
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LF	LINEAR FOOT (FEET)
LGT	LEAVING GLYCOL TEMPERATURE
LH	LATENT HEAT
LPG	LIQUID PROPANE GAS
LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)
LPRC	LOW PRESSURE STEAM RETURN (CLEAN)
LLHX	LIQUID TO LIQUID HEAT EXCHANGER
LPS	LOW PRESSURE STEAM
LPSC	LOW PRESSURE STEAM (CLEAN)
LSD	LINEAR SLOT DIFFUSER
LTCP	LOCAL TEMPERATURE CONTROL PANEL
LVG	LEAVING
LVR	LOUVER
LWT	LEAVING WATER TEMPERATURE
M	METER, SI UNIT
M/s	METERS PER SECOND (OR METERS/SECOND)
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MB	MIXING BOX
MBH	1000 BTUH
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MER	MECHANICAL EQUIPMENT ROOM
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MH	MANHOLE
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MM	MILLIMETER
MOV	MOTOR OPERATED VALVE
MPR	MEDIUM PRESSURE RETURN (STEAM CONDENSATE)
MPS	MEDIUM PRESSURE STEAM
MRI	MAGNETIC RESONANCE IMAGING
MTD	MEAN TEMPERATURE DIFFERENCE
MVD	MANUAL VOLUME DAMPER
MZ	MULTI-ZONE
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NG	NATURAL GAS
NGFM	NATURAL GAS FLOWMETER
NO	NORMALLY OPEN
NOAA	NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NOM	NOMINAL
NPLV	NON-STANDARD PART LOAD VALUE
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAG	OUTSIDE AIR GRILLE
OAI	OUTSIDE AIR INTAKE
OD	OUTSIDE DIAMETER
OFM	OIL FLOWMETER
OR	OPERATING ROOM
P	PUMP
PA	PASCAL
PC	PUMPED CONDENSATE
PCF	POUNDS PER CUBIC FOOT (FEET)
PD	PRESSURE DROP
PEF	PROPELLER (TYPE) EXHAUST FAN
PF	PRE-FILTER
PG	PRESSURE GAGE
PGW	PROPYLENE GLYCOL-WATER (SOLUTION)
PHC	PREHEAT COIL
PPM	PARTS PER MILLION
PRS	PRESSURE REGULATING (VALVE) STATION
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAGE
PSS	PRIMARY SECONDARY SYSTEM
PSV	PRESSURE SAFETY VALVE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
R/E	RETURN OR EXHAUST
RA	RETURN AIR
RAD	REFRIGERANT AIR DRYER
RAF	RADIO FREQUENCY
RAHX	ROTARY AIR HEAT EXCHANGER
RAT	RETURN AIR TEMPERATURE
RCCH	REMOTE CONDENSER CHILLER
RCU	RECIPROCATING CHILLER UNIT
RD	REFRIGERANT DISCHARGE
RDS	ROOM DATA SHEETS
REA	RELIEF AIR
RF	RETURN FAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID LINE
RLA	RUN LOAD AMPERE
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
RV	RELIEF VALVE
SA	SUPPLY AIR
SAD	SOUND ATTENUATING DEVICE
SAT	SUPPLY AIR TEMPERATURE
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCI	SPINAL CODE INJURY
SCR	SILICON CONTROLLED RECTIFIER
SD	SMOKE DETECTOR
SD	SUPPLY AIR DIFFUSER
SD-1	SCHEMATIC DESIGN (SUBMISSION1)
SD-2	SCHEMATIC DESIGN (SUBMISSION2)
SDPR	SMOKE DAMPER
SDR	SMOKE DAMPER (RETURN)
SDS	SMOKE DAMPER (SUPPLY)
SEN	SENSIBLE HEAT
SF	SUPPLY FAN
SG	SUPPLY AIR GRILLE
SH	STEAM HUMIDIFIER
SHC	STEAM HEATING COIL
SI	SQUARE INCHES
SP	STATIC PRESSURE
SP GR	SPECIFIC GRAVITY
SPD	SUPPLY PROCESS AND DISTRIBUTION
SPRV	STEAM PRESSURE REDUCING VALVE
SPS	STATIC PRESSURE SENSOR
SQ FT	SQUARE FOOT (FEET)
SR	SUPPLY AIR REGISTER
SS	STAINLESS STEEL
SSHX	STEAM TO STEAM HEAT EXCHANGER
SSR	SOLID SEPARATOR
ST	STEAM TRAP
SUH	STEAM UNIT HEATER
SV	STEAM PRESSURE REDUCING VALVE
SVS	STEAM VENT SILENCER
SWHX	STEAM TO WATER HEAT EXCHANGER
T & PCV	TEMPERATURE AND PRESSURE CONTROL VALVE
TAB	TESTING, ADJUSTING, BALANCE
TD	TEMPERATURE DIFFERENCE
TDH	TOTAL DYNAMIC HEAD
TDS	TOTAL DISSOLVED SOLIDS
TG	TRANSFER GRILLE
TP	TRAP
TR	TOP REGISTER
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TU	TERMINAL UNIT
TWU	THRU-WALL UNIT
UC	UNDER CUT
UC	UNIT COOLER
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
URV	UPBLAST UNIT VENTILATOR
V	VALVE
VAF	VANE-AXIAL FAN
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD	VARIABLE FREQUENCY DRIVE
VHA	VETERANS HEALTH ADMINISTRATION
VI	VIBRATION ISOLATOR
VIV	VARIABLE INLET VANES
VP	VACUUM PUMP
VPS	VARIABLE PRIMARY SYSTEM
VR	VACUUM (STEAM CONDENSATE) RETURN
VSD	VARIABLE SPEED DRIVE
VUH	VERTICAL UNIT HEATER
W	WATTS
WAG	WASTE ANETHESIA GAS
Wb	WET-BULB (TEMPERATURE)
WC	WATER COOLED
WCCH	WATER COOLED CHILLER
WCCU	WATER COOLED CONDENSING UNIT
WCHP	WATER COOLED HEAT PUMPS
WCPU	WATER COOLED PACKAGED UNIT
WEF	WALL EXHAUST FAN
WF	WATER FILTER
WFCV	WATER FLOW CONTROL VALVE
WFM	WATER FLOWMETER
WFMD	WATER FLOW MEASURING DEVICE
WG	WATER GAGE
WPD	WATER SIDE PRESSURE DROP
YR	YEAR

SYMBOL LEGEND

2 / H4	DETAIL DESIGNATION — DETAIL NUMBER; DRAWING NUMBER WHERE DRAWN
A / H7	SECTION DESIGNATION — SECTION LETTER; DRAWING NUMBER WHERE SHOWN
26-SF 3	BUILDING NO. WHERE EQUIPMENT IS LOCATED. EQUIPMENT ABBREVIATION (SUPPLY FAN) SUPPLY FAN NO. 3 IN BUILDING NO. 26 TYPICAL UNIT NO.
26-TU-I-I	BUILDING NO. WHERE EQUIPMENT IS LOCATED ITEM (TERMINAL UNIT SHOWN) ITEM NUMBER (TERMINAL UNIT NO. 1) SERVED BY AIR HANDLER UNIT NO. 1
UP / DN	SUPPLY DUCT (UP & DOWN)
UP / DN	EXHAUST DUCT (UP & DOWN)
UP / DN	RETURN DUCT (UP & DOWN)
	ROUND AND SQUARE 4-WAY CEILING DIFFUSERS
	SQUARE 3-WAY CEILING DIFFUSERS
	SQUARE 2-WAY CEILING DIFFUSERS
	SQUARE 1-WAY CEILING DIFFUSERS
	LINEAR SLOT DIFFUSER
	SUPPLY TOP REGISTER OR GRILLE (WALL TYPE)
	EXHAUST OR RETURN CEILING REGISTER OR GRILLE
	EXHAUST OR RETURN BOTTOM REGISTER OR GRILLE (WALL TYPE)
	EXHAUST OR RETURN REGISTER OR TOP GRILLE (WALL TYPE)
	VANED ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF
	CONNECT NEW DUCT TO EXISTING DUCT
R	INCLINED RISE, IN DIRECTION OF AIR FLOW
D	INCLINED DROP, IN DIRECTION OF AIR FLOW
	LIMIT OF DEMOLITION
FC	FLEXIBLE CONNECTION, EQUIPMENT, VIBRATION, OR SEISMIC
	VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING)
	VANED ELBOW (SHORT RADIUS)
	STANDARD RADIUS ELBOW (LONG RADIUS)
10x8	NEW DUCT (INSIDE DIM: WIDTH x DEPTH)
	EXISTING DUCT TO REMAIN
	EXISTING DUCT TO BE REMOVED
	LOUVER (LOUVER SPECIFIED IN ARCHITECTURAL SECTION.)
	FLEXIBLE DUCTWORK (INSULATED)
	DUCT WITH SOUND LINING
VD	MANUAL VOLUME DAMPER
FD	FIRE DAMPER
BDD	BACK DRAFT DAMPER
F/S DPR, N	COMBINATION FIRE/SMOKE DAMPER
2, 1, 4, 1/2	POINT OF CHANGE IN DUCT CONSTRUCTION BY STATIC PRESSURE CLASS. THE NUMBER ASSIGNS PRESSURE CLASS (IN. OF WATER) WHICH WILL ACCOMMODATE MAXIMUM OPERATING PRESSURE IN THE DUCT SUBSECTION. THE SYMBOL CONT. THE ASSIGNMENT UNTIL THE DUCT TERMINATES OR ANOTHER SYMBOL APPEARS. A "N" SUPERSCRIPT INDICATES NEGATIVE PRESSURE.
	AUTOMATIC CONTROL DAMPER MODULATING
	AUTOMATIC CONTROL DAMPER TWO POSITION
	STAINLESS STEEL DUCT
	MANUAL SPLITTER DAMPER

SYMBOL LEGEND

45° SUPPLY / 45° RETURN	STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)
	DUCT MOUNTED COIL (HOT WATER OR STEAM COIL)
	DUCT MOUNTED COIL (ELECTRIC)
	CONVECTOR OR RADIATOR (RECESSED)
	CONVECTOR OR RADIATOR (WALL HUNG)
A FCU	FLOOR MOUNTED VERTICAL RECESSED FAN COIL UNIT. LETTER INDICATES UNIT SIZE.
A FCU	FLOOR MOUNTED VERTICAL CABINET FAN COIL UNIT. LETTER INDICATES UNIT SIZE.
A TWU	THRU WALL AIR CONDITIONING UNIT. LETTER INDICATES UNIT SIZE.
A PTAC	WINDOW TYPE AIR CONDITIONING UNIT. LETTER INDICATES UNIT SIZE.
A PTAC	FLOOR MOUNTED HEAT PUMP. LETTER INDICATES UNIT SIZE.
	AIR CURTAIN
	UNIT HEATER (HORIZONTAL)
	UNIT HEATER (VERTICAL)
	2'x2' RADIANT CEILING PANEL
	2'x4' RADIANT CEILING PANEL
	TERMINAL UNIT WITH REHEAT COIL
MB	DOUBLE DUCT MIXING BOX.
	FAN POWERED VARIABLE VOLUME TERMINAL UNIT WITH HEATING COIL.
HPS	HIGH PRESSURE STEAM (60 PSIG AND ABOVE)
HPR	HIGH PRESSURE STEAM CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM (16 PSIG TO 59 PSIG)
MPR	MEDIUM PRESSURE STEAM CONDENSATE RETURN
LPS	LOW PRESSURE STEAM (15 PSIG AND BELOW)
LPR	LOW PRESSURE STEAM CONDENSATE RETURN
PC	CONDENSATE PUMP DISCHARGE
HWS	HOT WATER HEATING SUPPLY
HWR	HOT WATER HEATING RETURN
GHS	GLYCOL-WATER HEATING SUPPLY
GHR	GLYCOL-WATER HEATING RETURN
SWS	SOLAR WATER SUPPLY
SWR	SOLAR WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RHG	REFRIGERANT HOT GAS
CWS	CONDENSER WATER SUPPLY (FROM TOWER)
CWR	CONDENSER WATER RETURN (TO TOWER)
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
GCS	CHILLED GLYCOL-WATER SUPPLY
GCR	CHILLED GLYCOL-WATER RETURN
MW	MAKE-UP WATER
D	DRAIN LINE
V	VENT LINE
GRS	GLYCOL-WATER RUN AROUND SUPPLY
GRR	GLYCOL-WATER RUN AROUND RETURN
X	EXISTING PIPE TO BE REMOVED
FWPD	FEEDWATER PUMP DISCHARGE
FWPS	FEEDWATER PUMP SUCTION
CTPD	CONDENSATE TRANSFER PUMP DISCHARGE
CTPS	CONDENSATE TRANSFER PUMP SUCTION
VR	VACUUM CONDENSATE RETURN
TC	TUBE CLEANER WATER SUPPLY
BO	BOILER BLOWOFF
CBD	CONTINUOUS BLOWDOWN
BWS	BOILER WATER SAMPLE
FWS	FEEDWATER SAMPLE (FROM DEAERATOR)
CF	CHEMICAL FEED
OFL	OVERFLOW
A	COMPRESSED AIR
G	NATURAL GAS MAIN FUEL
G(I)	NATURAL GAS IGNITER FUEL
LPG(I)	LIQUEFIED PETROLEUM GAS IGNITER FUEL
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
CW	COLD WATER (CITY WATER)
SW	SOFTENED WATER
HW	HOT WATER

SYMBOL LEGEND

RH	ROLLER-TYPE HANGER
SH	VARIABLE SPRING-TYPE HANGER (TYPE 51)*
SCH	SPRING CUSHION-TYPE HANGER (TYPE 48 OR 49)*
	CLEVIS-TYPE HANGER
TH	TRAPEZE HANGER (PROVIDE U-BOLT PIPE ATTACHMENT TO TRAPEZE EXCEPT WHERE RH ARE INDICATED)
PS	FLOOR-SUPPORTED PIPE STAND
RC	RISER CLAMP (TYPE 42)*
WB	WALL BRACKET (TYPE 31, 32, 33)*
CSH	CONSTANT SUPPORT HANGER (TYPE 54, 55, 56)*
SS	SLIDING SUPPORTS (TYPE 35)*

* TYPE NUMBERS REFER TO MANUFACTURER'S STANDARDIZATION SOCIETY STANDARD PRACTICE SP-58

	DIRECTION OF PIPE PITCH (DOWN)
	DIRECTION OF FLOW
	ANCHOR
	REDUCER OR INCREASER
	ECCENTRIC REDUCER
	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION, 45° OR 90°
	SIDE CONNECTION
	CAPPED OUTLET
	RISE OR DROP IN PIPE
	UNION
	PIPE UP
	PIPE DOWN
	INVERTED BUCKET TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	THERMOMETER
	PRESSURE GAGE
FE	FLOW ELEMENT
	REFRIGERANT SIGHT GLASS
	TEST PLUG (PRESSURE/TEMPERATURE)
AV	AUTOMATIC AIR VENT
MV	MANUAL AIR VENT
	QUICK-COUPLE HOSE CONNECTOR
	GATE VALVE - THREADED/FLANGED
	GLOBE VALVE - THREADED/FLANGED
	GATE VALVE WITH 3/4" HOSE ADAPTER
	CHECK VALVE
	WYE STRAINER (WITH BALL VALVE & HOSE CONN.)
	WYE STRAINER WITH VALVED DRAIN AND QUICK-COUPLE HOSE CONNECTOR
	FLEXIBLE CONNECTION
	ANGLE GLOBE VALVE
	BUTTERFLY VALVE
	BALL VALVE
	MODULATING CONTROL VALVE
	MODULATING CONTROL BUTTERFLY VALVE
	TWO POSITION CONTROL VALVE
	THREE-WAY MODULATING CONTROL VALVE
	THREE-WAY TWO POSITION CONTROL VALVE
	PRESSURE REGULATING VALVE
	PRESSURE SAFETY VALVE
	AUTOMATIC BALANCING CONTROL VALVE
	WATER BALANCE DEVICE
	CIRCUIT SETTER VALVE
	GATE VALVE WITH GLOBE-VALVED BYPASS
	PLUG VALVE
	CONTROL VALVE (CV) - FLOAT-OPERATED
	PRESSURE REDUCING VALVE (PRV)
LC	WATER LEVEL CONTROLLER
M	FLOW METER
T	ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT
M	ROOM HUMIDISTAT/TRANSMITTER - WALL MOUNT
TT	TEMPERATURE TRANSMITTER
TT	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
MT	MOISTURE (HUMIDITY) TRANSMITTER
PT	PRESSURE TRANSMITTER
SPS	STATIC PRESSURE SENSOR
FT	FLOW TRANSMITTER
IT	CURRENT TRANSMITTER
CT	CONDUCTIVITY TRANSMITTER
SD	SMOKE DETECTOR

SYMBOL LEGEND

PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PDS	PRESSURE DIFFERENTIAL SWITCH
HS	HAND SWITCH (HAND-OFF-AUTO SWITCH)
ZC	VALVE OR DAMPER POSITION CONTROLLER
KR	LOCAL RECORDING TIME CLOCK (RUNTIME)
TSL	TEMPERATURE SWITCH, LOW (FREEZESTAT)
TSH	TEMPERATURE SWITCH, HIGH (FREEZESTAT)
LC	LEVEL CONTROLLER
LT	LEVEL TRANSMITTER
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
EPT	ELECTRONIC TO PNEUMATIC TRANSDUCER
AT CO2	CARBON DIOXIDE TRANSMITTER
AT CO	CARBON MONOXIDE TRANSMITTER
AT OC	OCCUPANCY SENSOR
LTCP	LOCAL TEMPERATURE CONTROL PANEL
HVAC	HVAC CONTROL PANEL
VSMC	VARIABLE SPEED MOTOR CONTROLLER
ECC	INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
TC	TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
PC	PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
SC	SPEED CONTROLLER. SEE SEQUENCE OF OPERATION
FC	FLOW CONTROLLER. SEE SEQUENCE OF OPERATION
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
KC	TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE
	TEMPERATURE SENSING ELEMENT FOR TRANSMITTING TEMPERATURE TO EMCS (PROVIDE 12 INCHES [200mm] MINIMUM LENGTH IN DUCT WHEN SPACE PERMITS.)
A	SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO EMCS
	MOTOR STARTER
M	ELECTRIC OPERATED CONTROL DAMPER/OR VALVE

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
2. IN THE EVENT OF A DISCREPANCY BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS, THE MOST STRINGENT SHALL GOVERN.
3. INSTALL ALL PIPING AND DUCTWORK TO AVOID ARCHITECTURAL FRAMING, STRUCTURAL MEMBERS, AND OTHER OBSTRUCTIONS. COORDINATE PIPING AND DUCTWORK LOCATION WITH ALL APPLICABLE CONTRACT DRAWINGS PRIOR TO PLACING SLEEVES IN FLOORS OR WALLS.
4. INSTALL ALL PIPING AND DUCTWORK TO BEST SUIT FIELD CONDITIONS AND COORDINATE WITH THE INSTALLATION WORK OF OTHER TRADES. THE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO DETERMINE EXACT LOCATIONS OF PIPING OR DUCTWORK.
5. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT DIFFUSER LOCATIONS AND FINISHED CEILING.
6. COORDINATE DUCTWORK, PIPING WITH STRUCTURAL DRAWINGS, LIGHTING AND SPRINKLER SYSTEM. PROVIDE TRANSITIONS AS REQUIRED.
7. CONTRACTOR TO COORDINATE WITH ARCHITECTS CEILING ACCESS PANELS FOR ALL FIRE, SMOKE AND VOLUME DAMPERS IN INACCESSIBLE CEILING AS REQUIRED.
8. ALL DUCT DIMENSIONS ARE AIRSTREAM DIMENSIONS.
9. REFER TO SPECIFICATION, DIVISION I FOR ADDITIONAL PROVISIONS REQUIRED UNDER THIS CONTRACT.
10. SEAL ALL FIRE RATED PENETRATIONS WITH FIRE RETARDANT MATERIAL AS SPECIFIED.
11. PROVIDE REMOTE OPERATORS FOR ALL VOLUME DAMPERS LOCATED ABOVE INACCESSIBLE CEILING.
12. PROVIDE OPERATING HANDLES FOR ALL VALVE AND COCKS WITHOUT INTEGRAL OPERATORS.
13. PROVIDE VALVES AND OTHER PIPING SPECIALTIES SAME SIZE AS LINE SIZE SHOWN UNLESS OTHERWISE NOTED.
14. INSTALL SWING CHECK VALVES IN THE HORIZONTAL POSITION.
15. PROVIDE 3/8" BLOW-OFF VALVE AND 1/2" IPS TO HOSE THREAD ADAPTER ON ALL STRAINERS.
16. ALL BRANCH DUCTS TO AIR OUTLET SHALL BE EQUIPPED WITH DUCT VOLUME DAMPER.
17. PROVIDE UNIONS OR FLANGES ON EACH SIDE OF CONTROL VALVES. EVERY PIPING ASSEMBLY SHALL BE MADE SO AS TO MAKE EVERY VALVE AND PIECE OF EQUIPMENT EASILY REMOVABLE. WELDED OR SOLDER-JOINT VALVES ARE EXCEPTED FROM THIS REQUIREMENT.
18. CEILING DIFFUSER SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
19. SEPARATE ALL CEILING HANGING AND BRACING WIRES AT LEAST 6" FROM ALL UNBRACED DUCTS, PIPES, CONDUITS, ETC. AT THE CONTRACTOR'S OPTION HE MAY BRACE UNBRACED DUCTS, PIPES, CONDUITS, ETC. IN A MANNER CONFORMING TO REQUIREMENTS ESTABLISHED BY THE MECHANICAL AND ELECTRICAL CONTRACT DOCUMENTS, OR THE CONTRACTOR MAY INSTALL TRAPEZE SUPPORTS TO RECEIVE THE CEILING HANGING AND BRACING WIRES. THE GENERAL CONTRACTOR SHALL COORDINATE THE WORK AND RESPONSIBILITY FOR ACCOMMODATING SUCH WORK.
20. PROVIDE BALANCING DAMPERS AT EACH SUPPLY, RETURN, AND EXHAUST BRANCH TAKE-OFF.
21. DUCTS STORED ON THE CONSTRUCTION SITE SHALL BE PROTECTED AND ISOLATED FROM DUST CONTAMINATION.
22. BE RESPONSIBLE FOR ALL CUTTING AND PATCHING NECESSARY FOR THE COMPLETION OF WORK.

GENERAL NOTES

24. SEE ARCHITECTURAL DOCUMENTS FOR PAINTING OF ALL EXPOSED DUCTWORK, PIPING, AIR OUTLET AND FIXTURE TRIM. PAINT FLAT BLACK THE INSIDE OF ALL DUCTWORK VISIBLE THROUGH DIFFUSERS, GRILLES, AND REGISTERS..
25. INSTALL SHUT-OFF VALVES AT EACH BRANCH PIPE LINE.
26. UNLESS SPECIFICALLY SPECIFIED OR SHOWN OTHERWISE ALL CONSTRUCTION IS TO CONFORM TO SMACNA HVAC CONSTRUCTION STANDARDS, TWO INCH PRESSURE CLASSIFICATION.
27. REFER TO ARCHITECTURAL SPECIFICATION FOR APPROVED FIRESTOPPING SYSTEM.
28. MOUNT ROOM THERMOSTATS AND OTHER CONTROL DEVICES AT 48-INCHES ABOVE FINISHED FLOOR, UNLESS OTHERWISE INDICATED.
29. ALL PLENUM BOXES, DUCTWORK ETC TO BE LOCATED INSIDE WALL CAVITIES OR INACCESSIBLE SPACES SHALL BE TESTED FOR AIRTIGHT CONSTRUCTION BEFORE INSTALLATION (TYPICAL).
30. ALL PIPING TO BE LOCATED INSIDE WALL CAVITIES OR INACCESSIBLE SPACES SHALL BE LEAK TESTED AND INSULATED WITH VAPOR BARRIER SEAL BEFORE INSTALLATION (TYPICAL).
31. INSTALL AUTOMATIC AIR VENTS AT ALL HIGH POINTS OF HYDRONIC PIPING.
32. PROVIDE ALL REQUIRED PERMITS, INSPECTIONS AND COORDINATION WITH GOVERNING AUTHORITIES, INSTALLATION TO CONFORM WITH CURRENT APPLICABLE PROVISIONS OF:
    2012 INTERNATIONAL BUILDING CODE
    2012 INTERNATIONAL MECHANICAL CODE
    2012 INTERNATIONAL PLUMBING CODE
33. ALL PIPING TO BE FLEXIBLE CONNECTED TO EQUIPMENT.
34. NOT ALL SYMBOLS, ABBREVIATIONS AND NOTES MAY BE USED FOR THIS PROJECT.
35. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
36. PROVIDE ACCESS DOORS OR PANELS FOR ALL EQUIPMENT, VALVES, AND ALL OTHER ITEMS LOCATED IN OTHERWISE INACCESSIBLE LOCATION WHICH REQUIRED ROUTINE ADJUSTMENT OR SERVICING. PROVIDE ACCESS LARGE ENOUGH TO ADEQUATELY PERMIT MAINTENANCE AND INSPECTION OF THE DEVICE.
37. CONTRACTOR TO INCLUDE ALL OFFSETS AND TRANSITIONS OF DUCTWORK AND PIPING FOR PROPER FUNCTION OF THESE SYSTEMS WHETHER OR NOT SHOWN IN DRAWINGS.
38. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. PROVIDE TRANSITION FOR FINAL CONNECTION TO EQUIPMENT.
39. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OF WORK.
40. PAINT INSIDE OF ALL DUCTWORK VISIBLE THROUGH DIFFUSERS, GRILLES, AND REGISTERS FLAT BLACK.
41. DUCT SYSTEMS SHALL BE BALANCED TO QUANTITIES SHOWN ON THE DRAWINGS.

GENERAL CONDITION

1. ALL WORK TO BE IN ACCORDANCE WITH REQUIREMENTS OF GOVERNING LOCAL FIRE CODES AND BUILDING CODES.
2. VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS. NOTIFY ARCHITECT OF ANY DISCREPANCIES FOUND. VERIFY DIMENSIONS OF ALL OWNER FURNISHED OPERATING EQUIPMENT TO ENSURE PROPER COORDINATION WITH CONSTRUCTION.
3. SCHEDULE ALL WORK ACCESS AND STORAGE WITH THE FACILITY ADMINISTRATOR.
4. CONTRACTOR SHALL PROVIDE DUST COVERS AS REQUIRED TO CONTAIN DUST AND DEBRIS WITHIN CONSTRUCTION AREA AND KEEP DIRT AND DUST TO A MINIMUM.
5. ALL REMOVED ITEMS DEEMED TO HAVE VALUE BY THE OWNER SHALL BE DELIVERED TO A PLACE OF STORAGE AT THE SITE AS DIRECTED. ALL OTHER ITEMS MUST BE DISPOSED OF OFF SITE IN A LEGAL MANNER.
6. WHERE EXISTING CONSTRUCTION IS CUT, DAMAGED, OR REMODELED, PATCH WITH MATERIALS TO MATCH IN KIND, QUALITY AND PERFORMANCE.
7. CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR SAFETY OF ALL PERSONS ON OR ABOUT THE CONSTRUCTION SITE IN ACCORDANCE WITH APPLICABLE LAWS AND CODES. GUARD ALL HAZARDS IN ACCORDANCE WITH THE SAFETY PROVISIONS OF THE LATEST MANUAL OF ACCIDENT PREVENTION PUBLISHED BY THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA.
8. CLEAN ALL EXPOSED SURFACES AND NEW EQUIPMENT AFTER COMPLETION.
9. WHEN INSTALLING DRILLED-IN ANCHORS AND/OR POWDER DRIVEN PINS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCEMENT AND THE DRILLED-IN ANCHOR AND/OR PIN.

SHEET INDEX

SHEET NO.	SHEET NAME	SCALE
M001	MECHANICAL LEGEND ABBREVIATIONS AND GENERAL NOTES	NONE
M101	MECHANICAL SCHEDULES	NONE
M102	MECHANICAL SCHEDULES	NONE
M103	MECHANICAL SCHEDULES	NONE
MS101	MECHANICAL SITE PLAN	1/32"
MH101	MECHANICAL FLOOR PLAN - NORTH WING	1/8"
MH102	MECHANICAL FLOOR PLAN - WEST WING	1/8'
MH103	MECHANICAL ATTIC PLAN - NORTH WING	1/8"
MH104	MECHANICAL ATTIC PLAN - WEST WING	1/8"
MH105	ENLARGED MECHANICAL ROOM PLAN AND SECTIONS	1/4"
MH201	MECHANICAL ROOF PLAN - NORTH WING	1/8'
MH202	MECHANICAL ROOF PLAN - WEST WING	1/8"
MP101	MECHANICAL HYDRONIC PIPING FLOOR PLAN - NORTH WING	1/8"
MP102	MECHANICAL HYDRONIC PIPING FLOOR PLAN - WEST WING	1/8'
M301	AIRFLOW AND PIPING DIAGRAMS	NONE
M302	CONTROL DIAGRAMS	NONE
M401	DETAILS	NONE
M402	DETAILS	NONE

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions:	Date

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Drawing Title	MECHANICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES
Approved: Project Director	
Project Title	EXPAND COMMUNITY LIVING CENTER PHASE 1
Location	2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date	OCTOBER 29, 2015
Checked	MT
Drawn	NS/GL
Project Number	570-218
Building Number	31
Drawing Number	M001
Dwg. of	

Office of Construction and Facilities Management
Department of Veterans Affairs

ROOM AIR BALANCE SCHEDULE

ROOM NO	ROOM NAME	AIR HANDLING UNIT NO	TERMINAL UNIT	INDIVIDUAL ROOM TEMP CONTROL	SUPPLY: ROOM AIR FLOW CFM	SUPPLY: ROOM AIR FLOW L/S	SUPPLY: # OF AIR DEVICES	SUPPLY: AIR DEVICE MARK	SUPPLY: SUPPLY FAN	RETURN OR EXHAUST: RETURN OR EXHAUST (R/E)	RETURN OR EXHAUST: ROOM AIR FLOW CFM	RETURN OR EXHAUST: ROOM AIR FLOW L/S	RETURN OR EXHAUST: # OF AIR DEVICES	RETURN OR EXHAUST: AIR DEVICE MARK	RETURN OR EXHAUST: RETURN OR EXHAUST FAN	ROOM AIR FLOW: CV	ROOM AIR FLOW: VAV	ROOM AIR BALANCE	NET INFILTRATION: CFM	NET INFILTRATION: [L/s]	NET EXFILTRATION: CFM	NET EXFILTRATION: [L/s]	REMARKS
1D-1	CORRIDOR	AHU-1	SAV-1-20	N	620	[290]	2	SD-24	SF-1	R	1020	[480]	2	RG-24	RF-1		x	0	400	[190]	0	[ ]	
1D01	RESIDENT BEDROOM	AHU-1	SAV-1-15	Y	290	[140]	1	SD-23	SF-1	R	215	[100]	1	RG-23	RF-1		x	0	0	[ ]	75	[35]	
1D01A	RESIDENT BATHROOM	AHU-1	SAV-1-15	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1D02	RESIDENT BEDROOM	AHU-1	SAV-1-16	Y	290	[140]	1	SD-23	SF-1	R	215	[100]	1	RG-23	RF-1		x	0	0	[ ]	75	[35]	
1D02A	RESIDENT BATHROOM	AHU-1	SAV-1-16	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1D03 & 3A	DINING AREA / KITCHEN	AHU-1	SAV-1-17	Y	910	[430]	3	SD-53 & 54	SF-1	R	910	[430]	1	RG-23	RF-1		x	0	0	[ ]	0	[ ]	
1D04	RESIDENT BEDROOM	AHU-1	SAV-1-18	Y	290	[140]	1	SD-23	SF-1	R	215	[100]	1	RG-23	RF-1		x	0	0	[ ]	75	[35]	
1D04A	RESIDENT BATHROOM	AHU-1	SAV-1-18	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1D05	RESIDENT BEDROOM	AHU-1	SAV-1-19	Y	290	[140]	1	SD-23	SF-1	R	215	[100]	1	RG-23	RF-1		x	0	0	[ ]	75	[35]	
1D05A	RESIDENT BATHROOM	AHU-1	SAV-1-19	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1D10	MEDICATION ROOM	AHU-1	SAV-1-21	N	25	[12]	1	SD-21	SF-1	N/A	N/A	N/A	N/A	N/A	RF-1		x	+	0	[ ]	25	[12]	
1D11	CORRIDOR	AHU-1	SAV-1-21	Y	100	[47]	1	SD-21	SF-1	N/A	N/A	N/A	N/A	N/A	RF-1		x	+	0	[ ]	100	[47]	
1D11A	CLEAN LINEN STORAGE	AHU-1	SAV-1-21	N	75	[35]	1	SD-21	SF-1	E	75	[35]	N/A	N/A	RF-1		x	+	0	[ ]	75	[35]	
1D11B	UTILITY ROOM, SOILED	AHU-1	SAV-1-21	N	0	[ ]	N/A	N/A	SF-1	E	75	[35]	1	EG-21	EF-2		x	-	75	[35]	0	[ ]	
1D11C	TOILET, STAFF	AHU-1	SAV-1-21	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1D11D	HOUSEKEEPING	AHU-1	SAV-1-21	N	N/A	N/A	N/A	N/A	SF-1	E	25	[12]	1	EG-22	EF-2		x	-	25	[12]	0	[ ]	
1D12	TOILET, VISITOR	AHU-1	SAV-1-21	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1D13	STORAGE	AHU-1	SAV-1-20	N	25	[12]	1	SD-21	SF-1	E	75	[35]	N/A	N/A	EF-2		x	+	0	[ ]	25	[12]	
1D15	NURSES' BREAK ROOM	AHU-1	SAV-1-22	Y	315	[150]	1	SD-23	SF-1	R	315	[150]	1	RG-22	RF-1		x	0	0	[ ]	0	[ ]	
1D15	NURSES WORKSTATION	AHU-1	SAV-1-20	Y	75	[35]	1	SD-23	SF-1	R	0	[ ]	N/A	N/A	RF-1		x	0	0	[ ]	75	[35]	
1D-3	FOYER	AHU-2	SAV-1-22	N	350	[170]	2	SD-24	SF-2	N/A	0	[ ]	N/A	N/A	RF-1		x	1	0	[ ]	350	[170]	
1D16	LIVING ROOM	AHU-1	SAV-1-23	Y	1110	[520]	6	(4) LS-11 (2) SD-54	SF-1	R	1110	[520]	1	RR-513	RF-1		x	0	0	[ ]	0	[ ]	
1D17	RESIDENT BEDROOM	AHU-1	SAV-1-15	Y	290	[140]	1	SD-23	SF-1	R	215	[100]	1	RG-23	RF-1		x	0	0	[ ]	75	[35]	
1D17	RESIDENT BATHROOM	AHU-1	SAV-1-15	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1D18	RESIDENT BEDROOM	AHU-1	SAV-1-16	Y	290	[140]	1	SD-23	SF-1	R	215	[100]	1	RG-23	RF-1		x	0	0	[ ]	75	[35]	
1D18	RESIDENT BATHROOM	AHU-1	SAV-1-16	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1E-1	CORRIDOR	AHU-1	SAV-1-6	Y	440	[210]	2	SD-12	SF-1	R	655	[310]	1	RG-22	RF-1		x	0	0	[ ]	150	[71]	
1E01	RESIDENT BEDROOM	AHU-1	SAV-1-1	Y	400	[190]	1	SD-24	SF-1	R	325	[150]	1	RG-24	RF-1		x	0	0	[ ]	75	[35]	
1E01A	RESIDENT BATHROOM	AHU-1	SAV-1-1	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-1		x	-	75	[35]	0	[ ]	
1E02	RESIDENT BEDROOM	AHU-1	SAV-1-2	Y	290	[140]	1	SD-23	SF-1	R	215	[100]	1	RG-23	RF-1		x	0	0	[ ]	75	[35]	
1E02A	RESIDENT BATHROOM	AHU-1	SAV-1-2	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-1		x	-	75	[35]	0	[ ]	
1E03	LIVING ROOM	AHU-1	SAV-1-3	Y	940	[440]	6	(4) LS-11 (2) SD-54	SF-1	R	940	[440]	1	RR-513	RF-1		x	0	0	[ ]	0	[ ]	
1E-3	FOYER	AHU-2	SAV-1-4	N	300	[140]	2	SD-24	SF-2	N/A	0	[ ]	N/A	N/A	RF-1		x	1	0	[ ]	300	[140]	
1E04	NURSES' BREAK ROOM	AHU-1	SAV-1-4	Y	245	[120]	1	SD-23	SF-1	R	245	[120]	1	RG-22	RF-1		x	0	0	[ ]	0	[ ]	
1E05	NURSES WORKSTATION	AHU-1	SAV-1-6	Y	75	[35]	1	SD-23	SF-1	R	0	[ ]	N/A	N/A	RF-1		x	0	0	[ ]	75	[35]	
1E06	STORAGE	AHU-1	SAV-1-6	N	25	[12]	1	SD-21	SF-1	E	75	[35]	N/A	N/A	EF-2		x	+	0	[ ]	25	[12]	
1E07	TOILET, VISITOR	AHU-1	SAV-1-6	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1E08	CORRIDOR	AHU-1	SAV-1-5	Y	100	[47]	1	SD-21	SF-1	N/A	N/A	N/A	N/A	N/A	RF-1		x	+	0	[ ]	100	[47]	
1E08A	HOUSEKEEPING	AHU-1	SAV-1-5	N	N/A	N/A	N/A	N/A	SF-1	E	25	[12]	1	EG-22	EF-2		x	-	25	[12]	0	[ ]	
1E08B	TOILET, STAFF	AHU-1	SAV-1-5	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1E08C	UTILITY ROOM, SOILED	AHU-1	SAV-1-5	N	0	[ ]	N/A	N/A	SF-1	E	75	[35]	1	EG-21	EF-2		x	-	75	[35]	0	[ ]	
1E08D	CLEAN LINEN STORAGE	AHU-1	SAV-1-5	N	75	[35]	1	SD-21	SF-1	E	75	[35]	N/A	N/A	RF-1		x	+	0	[ ]	75	[35]	
1E09	MEDICATION ROOM	AHU-1	SAV-1-5	N	40	[19]	1	SD-21	SF-1	N/A	N/A	N/A	N/A	N/A	RF-1		x	+	0	[ ]	40	[19]	
1E10	RESIDENT BEDROOM	AHU-1	SAV-1-7	Y	320	[150]	1	SD-24	SF-1	R	245	[120]	1	RG-24	RF-1		x	0	0	[ ]	75	[35]	
1E10A	RESIDENT BATHROOM	AHU-1	SAV-1-7	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1E11	RESIDENT BEDROOM	AHU-1	SAV-1-8	Y	290	[140]	1	SD-24	SF-1	R	215	[100]	1	RG-24	RF-1		x	0	0	[ ]	75	[35]	
1E11A	RESIDENT BATHROOM	AHU-1	SAV-1-8	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1E12 & 12A	DINING AREA / KITCHEN	AHU-1	SAV-1-9	Y	1000	[470]	3	SD-53 & 54	SF-1	R	1000	[470]	1	RG-23	RF-1		x	0	0	[ ]	0	[ ]	
1E13	RESIDENT BEDROOM	AHU-1	SAV-1-10	Y	290	[140]	1	SD-24	SF-1	R	215	[100]	1	RG-24	RF-1		x	0	0	[ ]	75	[35]	
1E13A	RESIDENT BATHROOM	AHU-1	SAV-1-10	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1E14	RESIDENT BEDROOM	AHU-1	SAV-1-11	Y	400	[190]	1	SD-24	SF-1	R	325	[150]	1	RG-24	RF-1		x	0	0	[ ]	75	[35]	
1E14A	RESIDENT BATHROOM	AHU-1	SAV-1-11	N	N/A	N/A	N/A	N/A	SF-1	E	75	[35]	1	EG-22	EF-2		x	-	75	[35]	0	[ ]	
1E15	UTILITY ROOM	AHU-1	SAV-1-13	N	175	[83]	1	SD-21	SF-1	E	225	[110]	1	RR-511	RF-1	x		+	0	[ ]	50	[24]	OXYGEN TANK STORAGE
1E16	LOBBY	AHU-1	SAV-1-12	Y	1025	[480]	N/A	N/A	SF-1	N/A	1120	[530]	N/A	N/A	EF-1		x	0	90	[42]	0	[ ]	
1E17	TEL/DATA ROOM	AHU-1	SAV-1-26	Y	500	[240]	1	SD-24	SF-1	N/A	500	[240]	1	RG-24	EF-1		x	0	0	[ ]	0	[ ]	
1E18	LAUNDRY ROOM	AHU-1	SAV-1-7	Y	130	[61]	N/A	N/A	SF-1	N/A	130	[61]	1	EG-21	EF-1		x	0	0	[ ]	0	[ ]	

HVAC DESIGN DATA

DESIGN CONDITIONS	SUMMER: TEMP °F	SUMMER: TEMP [°C]	SUMMER: WET BULB TEMP °F	SUMMER: WET BULB TEMP [°C]	SUMMER: % HUMIDITY	WINTER: TEMP °F	WINTER: TEMP [°C]	WINTER: DEWPOINT TEMP °F	WINTER: DEWPOINT TEMP [°C]	WINTER: % HUMIDITY	LOWEST AVERAGE ANNUAL DEWPOINT °F	LOWEST AVERAGE ANNUAL DEWPOINT [°C]
OUTDOOR DESIGN CONDITIONS	101.1	[38]	70	[21]	N/A	31.5	[-]	N/A	N/A	NA	N/A	N/A
INDOOR AREA DESIGN CONDITIONS												
LOBBY	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
RESIDENT BEDROOM	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
CLEAN, SOILED UTILITY	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
STORAGE	70	[21]	62.6	N/A	N/A	70	N/A	N/A	N/A	N/A		
NURSE STATION	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
MEDICATION ROOM	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
DINING AREA	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
CORRIDOR	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
BREAKROOM	75	[24]	62.6	[17]	50	70	[21]	N/A	N/A	50		
MECHANICAL ROOM	84	[29]	62.6	[17]	N/A	40	[4]	N/A	N/A	N/A		
ELECTRICAL ROOM	86	[30]	62.6	[17]	N/A	40	[4]	N/A	N/A	N/A		
TEL/DATA ROOM	68	[20]	62.6	[17]	N/A	68	[20]	N/A	N/A	N/A		
LAUNDRY	78	[26]	62.6	[17]	60	70	[21]	N/A	N/A	60		

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions:	Date

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Drawing Title: MECHANICAL SCHEDULES

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

Drawing Number: M101

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Department of Veterans Affairs

ROOM AIR BALANCE SCHEDULE

ROOM NO	ROOM NAME	AIR HANDLING UNIT NO	TERMINAL UNIT	INDIVIDUAL ROOM TEMP CONTROL	SUPPLY: ROOM AIR FLOW CFM	SUPPLY: ROOM AIR FLOW L/S	SUPPLY: # OF AIR DEVICES	SUPPLY: AIR DEVICE MARK	SUPPLY: SUPPLY FAN	RETURN OR EXHAUST: RETURN OR EXHAUST (R/E)	RETURN OR EXHAUST: ROOM AIR FLOW CFM	RETURN OR EXHAUST: ROOM AIR FLOW L/S	RETURN OR EXHAUST: # OF AIR DEVICES	RETURN OR EXHAUST: AIR DEVICE MARK	RETURN OR EXHAUST: RETURN OR EXHAUST FAN	ROOM AIR FLOW CV	ROOM AIR FLOW VAV	ROOM AIR BALANCE	NET INFILTRATION CFM	NET INFILTRATION [L/s]	NET EXFILTRATION CFM	NET EXFILTRATION [L/s]	REMARKS
1E19	MECHANICAL ROOM	AHU-1	SAV-1-7	Y	450	[210]	N/A	N/A	SF-1	N/A	450	[210]	1	RR-511	EF-1	x		0	0	[ ]	0	[ ]	
1E20	STORAGE	AHU-1	SAV-1-13	N	45	[21]	N/A	N/A	SF-1	N/A	0	[ ]	N/A	N/A	EF-1	x		0	0	[ ]	0	[ ]	
1E21	ELECTRICAL ROOM	AHU-1	SAV-1-14	Y	740	[350]	1	SD-57	SF-1	N/A	740	[350]	1	RR-55	EF-1	x		0	0	[ ]	0	[ ]	
1E22	BOILER ROOM	N/A	N/A	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				0	[ ]	0	[ ]	
1E23	FIRE SPRINKLER ROOM	N/A	N/A	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				0	[ ]	0	[ ]	
1E24	AIR COOLED CHILLER	N/A	N/A	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				0	[ ]	0	[ ]	

NOTE
ROOMS OR AREAS DO NOT HAVE INDIVIDUAL HUMIDITY CONTROL UNLESS NOTED.

HOT WATER HEATING BOILER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	FLUID: FLOW GPM	FLOW [LPS]	EWT °F	EWT [°C]	LWT °F	LWT [°C]	WPD FT	WPD [kPa]	BOILER: POWER HP	POWER [kW]	OUTPUT GENERATED MBH	OUTPUT GENERATED [kW]	MAX HEAT INPUT MBH	MAX HEAT INPUT [kW]	% EFF	NATURAL GAS SUPPLY PRESSURE IN WG	NATURAL GAS SUPPLY PRESSURE [Pa]	FUEL	RELIEF VALVE SETTING PSIG	RELIEF VALVE SETTING [kPa]	ELECTRICAL: POWER HP	POWER [W]	PHASE	VOLT	REMARKS
BH-1	1E22	CLC	BUILDING HEATING HOT WATER	CONDENSING	54	[3]	140	[60]	160	[71]	2	[6]	16.6		518	[150]	600	[180]	92	7	[1800]	NG	75	[520]	5 FLA	#VALUE!	1	120	Hydrotherm KN6
BH-2	1E22	CLC	BUILDING HEATING HOT WATER	CONDENSING	54	[3]	140	[60]	160	[71]	2	[6]	16.6		518	[150]	600	[180]	92	7	[1800]	NG	75	[520]	5 FLA	#VALUE!	1	120	Hydrotherm KN6 100% Redundant Boiler

AIR COOLED CHILLER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	CAPACITY TONS	CAPACITY [kW]	# OF COMP	MAX kW/TON	MIN Eff {EER}	MAX IPLV (EER)	EVAPORATOR: FLOW GPM	FLOW [L/s]	EWT °F	EWT [°C]	LWT °F	LWT [°C]	MAX WPD FT	MAX WPD [kPa]	FOULING FACTOR	CONDENSER: AMBIENT OA TEMP °F	AMBIENT OA TEMP [°C]	ELECTRICAL: COMPRESSOR MOTOR # COMP	RLA	[kW]	PHASE	VOLT	CONDENSER FAN MOTORS: # FANS	NOMINAL POWER HP	NOMINAL POWER [W]	PHASE	VOLT	REMARKS
1-CH-1	1E24	CLC	Scroll	39.2	[140]	4	1.26	9.6	16.5	94	[6]	54	[12]	44	[7]	11.8	[35]	0.0001	103	[39]	4	18.6	[51]	3	460	4	1.5	[1100]	3	460	Daikin AGZ045E

NOTES
1. SEE SPECIFICATIONS FOR OTHER APPLICABLE ENGINEERING REQUIREMENTS.
2. "MAX kW/TON" AND "MIN Eff" SPECIFIED ARE AT DESIGN CONDITIONS INDICATED. kW/TON INCLUDES CONDENSER FANS.
3. SINGLE POINT POWER = 90.3 A.
4. MAX. SOUND POWER LEVEL AT 30 ft = 62 dba OVERALL. MAX. SOUND LEVEL = 90 dba OVERALL.
5. R410a.

EXPANSION & BUFFER TANK SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	APPROX SYSTEM VOLUME GAL	APPROX SYSTEM VOLUME [L]	SYSTEM TEMPERATURE RANGE MIN °F	MIN [°C]	MAX °F	MAX [°C]	INITIAL PRESSURE IN TANK PSIG	INITIAL PRESSURE IN TANK [kPa]	MAX OPERATING PRESSURE PSIG	MAX OPERATING PRESSURE [kPa]	FILL PRESSURE AT TANK: RELIEF VALVE PSIG	RELIEF VALVE [kPa]	AT TANK PSIG	AT TANK [kPa]	MIN VOLUME TANK GAL	MIN VOLUME TANK [L]	MIN BLADDER VOLUME GAL	MIN BLADDER VOLUME [L]	PIPE SIZE TO TANK IN	PIPE SIZE TO TANK [mm]	COLD WATER FILL SIZE IN	COLD WATER FILL SIZE [mm]	REMARKS
ET-1	1E22	HEATING WATER	VERT DIAPHRAGM	200	[760]	40	[4]	180	[82]	12	[83]	40	[280]	75	[520]	50	[350]	7.9	[30]	5.5	[21]	1	[25]	0.75	[19]	B&G B-35LA Size 10
ET-2	1E19	CHILLED WATER	VERT DIAPHRAGM	300	[1100]	40	[4]	90	[32]	12	[83]	40	[280]	75	[520]	50	[350]	1.5	[6]	1.2	[5]	1	[25]	0.75	[19]	B&G B-35LA Size 10
CWT-1	1E19	CHILLED WATER	VERT BUFFER TANK	NA		44		54		NA		40		NA		NA		200		NA		3		NA		Cemline V200CWB-3F-SL-15-1 with air vent, 1.5" insulation, & legs..

STEAM HUMIDIFER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SEVICE	HUMIDIFIER TYPE	AIR FLOW CFM	AIR FLOW [L/s]	# OF MANIFOLDS	EAT: Db °F	Db [°C]	Wb °F	Wb [°C]	DEWPOINT °F	DEWPOINT [°C]	LAT: DEWPOINT °F	DEWPOINT [°C]	SOURCE	STEAM: PRESS ENT VALVE PSIG	PRESS ENT VALVE [kPa]	PRESS ENT HEATER PSIG	PRESS ENT HEATER [kPa]	FLOW LBS/HR	FLOW [kg/HR]	CONTROL TYPE	TRAP: MARK	CAPACITY LBS/HR	CAPACITY [kg/HR]	REMARKS
HU-1	MECH/ELEC ROOM	AHU-1	UNIT-MOUNTED DISPERSION TUBE	11550	[5500]	3	55	[13]	42	[6]	10	[-12]	55	[13]	CLEAN STEAM	15	[100]	8	[55]	57	[26]	C-1	NA	0	[ ]	Based on AH at 50% cfm.

CHILLED WATER COOLING COIL SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	AIR FLOW CFM	AIR FLOW [L/s]	MAX FACE VELOCITY FPM	MAX FACE VELOCITY [M/s]	APD IN WG	APD [Pa]	EAT: Db °F	Db [°C]	Wb °F	Wb [°C]	LAT: Db °F	Db [°C]	Wb °F	Wb [°C]	TOTAL CAPACITY MBH	TOTAL CAPACITY [kW]	SENSIBLE CAPACITY MBH	SENSIBLE CAPACITY [kW]	CHILLED WATER: FLOW GPM	FLOW [L/s]	EWT °F	EWT [°C]	LWT °F	LWT [°C]	WPD FT	WPD [M]	REMARKS
CC-1	1E19	ALL	AHU-1	23900	[11000]	500	[3]	0.62	[160]	84	[29]	66	[19]	52	[11]	51	[11]	884	[260]	774	[230]	120	[8]	45	[7]	60	[16]	16	[5]	Future Phase 2 & 3 Final Buildout.
																						94	[6]	44	[7]	54	[12]	10	[3]	Phase 1 only.

NOTE
THE COOLING COIL FIN SPACING SHALL NOT EXCEED 132 FINS PER FOOT [400 FINS PER METER].

PUMP SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	CIRCULATING FLUID: FLUID	FLOW GPM	FLOW [L/s]	HEAD FT	HEAD [kPa]	NPSH AVAILABLE FT	NPSH AVAILABLE [kPa]	TEMPERATURE °F	TEMPERATURE [°C]	SP GR	MIN % EFF	ELECTRICAL MOTOR: NOMINAL POWER HP	NOMINAL POWER [kW]	PHASE	VOLT	MAX RPM	SPEED CONTROL	REMARKS
CHWP-1	1E1	ALL	CHILLED WATER	END SUCTION	CHILLED WATER	47	[3]	40	[640]	N/A	N/A	44	[7]	1	60.74	1.5	[1]	3	460	1800	CONSTANT	50% Load. B&G e-1510 1.25 AD
CHWP-2	1E1	ALL	CHILLED WATER	END SUCTION	CHILLED WATER	47	[3]	40	[640]	N/A	N/A	44	[7]	1	60.74	1.5	[1]	3	460	1800	CONSTANT	50% Load. B&G e-1510 1.25 AD
PHWP-1	1E22	ALL	HEATING HOT WATER	IN-LINE CENTRIFUGAL	HEATING HOT WATER	54	[3]	10	[160]	N/A	N/A	160	[71]	1	62.16	0.5	[ ]	3	460	1800	VARIABLE	100% Load. B&G e-1510 1.25AD
PHWP-2	1E22	ALL	HEATING HOT WATER	IN-LINE CENTRIFUGAL	HEATING HOT WATER	54	[3]	10	[160]	N/A	N/A	160	[71]	1	62.16	0.5	[ ]	3	460	1800	VARIABLE	100% Redundant Load. B&G e-1510 1.25AD
SHWP-1	1E22	ALL	HEATING HOT WATER	END SUCTION	HEATING HOT WATER	54	[3]	30	[480]	N/A	N/A	160	[71]	1	58.14	1	[1]	3	460	1800	VARIABLE	100% Load. B&G e-1510 1.25AD
SHWP-2	1E22	ALL	HEATING HOT WATER	END SUCTION	HEATING HOT WATER	54	[3]	30	[480]	N/A	N/A	160	[71]	1	58.14	1	[1]	3	460	1800	VARIABLE	100% Redundant Load. B&G e-1510 1.25AD

AIR SEPARATOR SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE	AIR SEPARATOR: SIZE IN IN	SIZE IN [mm]	FLOW GPM	FLOW [L/s]	WPD FT	WPD [kPa]	BUILT-IN STRAINER REQ'D	REMARKS
1-AS1	MECH/ELEC ROOM	HEATING WATER	FULL FLOW TANGENTIAL	4	[100]	240	[15]	3.2	[10]	NO	---
1-AS2	MECH ROOM	CHILLED WATER	FULL FLOW TANGENTIAL	4	[100]	94	[6]	3.2	[10]	NO	---

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions: | Date

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Drawing Title: MECHANICAL SCHEDULES

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

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Drawing Number: M102

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Department of Veterans Affairs

VA FORM 08-6231

P:\12\120-099 VA Fresno Expand Community Living Center\Dwgs\MECH\M102.dwg - M102 - hzhang - Nov 16, 2015 - 1:22pm

SINGLE DUCT AIR TERMINAL UNIT SCHEDULE

MARK	LOCATION	AREA AND/OR ROOM SERVED	SYSTEM AIR HANDLING	SIZE	AIR FLOW MAX CFM	AIR FLOW MAX [L/s]	AIR FLOW MIN CFM	AIR FLOW MIN [L/s]	ADDITIONAL SOUND ATTUNATION REQUIRED	CONTROL TYPE	CONTROL SEQUENCE	REHEAT HW	REHEAT ELEC	REHEAT NONE	PERIMETER SUPPLEMENTAL HEAT LINK	REMARKS
SAV-1-1	LEVEL 1	1E01	(N) AHU-1	6"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-2	LEVEL 1	1E02	(N) AHU-1	6"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-3	LEVEL 1	1E03	(N) AHU-1	10"	940	[440]	470	[220]	NONE	VAV	–	X			NONE	----
SAV-1-4	LEVEL 1	1E-3, 1E04	(N) AHU-1	8"	545	[260]	272.5	[130]	NONE	VAV	–	X			NONE	----
SAV-1-5	LEVEL 1	1E08A,B,C & D1E09	(N) AHU-1	8"	256	[100]	107.5	[51]	NONE	VAV	–	X			NONE	----
SAV-1-6	LEVEL 1	1E-1, 1E05, 1E06	(N) AHU-1	8"	590	[280]	295	[140]	NONE	VAV	–	X			NONE	----
SAV-1-7	LEVEL 1	1E10	(N) AHU-1	6"	320	[150]	160	[76]	NONE	VAV	–	X			NONE	----
SAV-1-8	LEVEL 1	1E11	(N) AHU-1	6"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-9	LEVEL 1	1E12 & 12A	(N) AHU-1	10"	1000	[470]	500	[240]	NONE	VAV	–	X			NONE	----
SAV-1-10	LEVEL 1	1E13	(N) AHU-1	6"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-11	LEVEL 1	1E14	(N) AHU-1	6"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-12	LEVEL 1	1E16	(N) AHU-1	10"	1125	[530]	562.5	[270]	NONE	VAV	–	X			NONE	----
SAV-1-13	LEVEL 1	1E19.	(N) AHU-1	8"	650	[310]	650	[310]	NONE	CAV	–	X			NONE	----
SAV-1-14	LEVEL 1	1E21	(N) AHU-1	8"	200	[94]	100	[47]	NONE	VAV	–	X			NONE	----
SAV-1-15	LEVEL 1	1D01 &1A	(N) AHU-1	6"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-16	LEVEL 1	1D02 &2A	(N) AHU-1	6"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-17	LEVEL 1	1D03 & 3A	(N) AHU-1	10"	910	[430]	455	[210]	NONE	VAV	–	X			NONE	----
SAV-1-18	LEVEL 1	1D04 & 3A	(N) AHU-1	8"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-19	LEVEL 1	1D05 & 5A	(N) AHU-1	8"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-20	LEVEL 1	1D-1, 1D13 & 14	(N) AHU-1	8"	620	[290]	310	[150]	NONE	VAV	–	X			NONE	----
SAV-1-21	LEVEL 1	1D10, 1D11, 11A, B & C	(N) AHU-1	8"	250	[94]	100	[47]	NONE	VAV	–	X			NONE	----
SAV-1-22	LEVEL 1	1D-3, 1D15	(N) AHU-1	8"	595	[280]	297.5	[140]	NONE	VAV	–	X			NONE	----
SAV-1-23	LEVEL 1	1D16	(N) AHU-1	10"	1110	[520]	555	[260]	NONE	VAV	–	X			NONE	----
SAV-1-24	LEVEL 1	1D17 & 17A	(N) AHU-1	8"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-25	LEVEL 1	1D18 & 18A	(N) AHU-1	8"	290	[140]	145	[68]	NONE	VAV	–	X			NONE	----
SAV-1-26	LEVEL 1	1E17	(N) AHU-1	8"	500	[240]	250	[120]	NONE	VAV	–	X			NONE	----
SAV-1-27	LEVEL 1	1E18	(N) AHU-1	6"	130	[61]	65	[31]	NONE	VAV	–	X			NONE	----

HOT WATER HEATING COIL SCHEDULE

MARK	LOCATION	AREA AND/OR ROOM SERVED	SYSTEM AND/OR SERVICE	APPLICATION	AIR FLOW CFM	AIR FLOW [L/s]	MAX FACE VELOCITY FPM	MAX FACE VELOCITY [M/s]	APD IN WG	APD [Pa]	EAT °F	EAT [°C]	LAT °F	LAT [°C]	TOTAL MIN CAPACITY MBH	TOTAL MIN CAPACITY [kW]	FLOW GPM	FLOW [L/s]	EWT °F	EWT [°C]	LWT °F	LWT [°C]	WPD FT	WPD [kPa]	% GLYCOL	REMARKS
SAV-1-1	LEVEL 1	1E01	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-2	LEVEL 1	1E02	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-3	LEVEL 1	1E03	(N) AHU-1	REHEAT	440	[210]	700	[4]	0.2	[50]	55	[13]	92	[33]	17.7	[60]	1.8	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-4	LEVEL 1	1E-3, 1E04	(N) AHU-1	REHEAT	275	[130]	700	[4]	0.2	[50]	55	[13]	88	[31]	9.8	[34]	1.0	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-5	LEVEL 1	1E08A,B,C & D1E09	(N) AHU-1	REHEAT	110	[52]	700	[4]	0.2	[50]	55	[13]	97	[36]	5.0	[17]	0.5	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-6	LEVEL 1	1E-1, 1E05, 1E06	(N) AHU-1	REHEAT	295	[140]	700	[4]	0.2	[50]	55	[13]	98	[37]	13.8	[47]	1.4	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-7	LEVEL 1	1E10	(N) AHU-1	REHEAT	160	[76]	700	[4]	0.2	[50]	55	[13]	85	[29]	5.2	[18]	0.5	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-8	LEVEL 1	1E11	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-9	LEVEL 1	1E12 & 12A	(N) AHU-1	REHEAT	500	[240]	700	[4]	0.2	[50]	55	[13]	82	[28]	14.6	[50]	1.5	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-10	LEVEL 1	1E13	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-11	LEVEL 1	1E14	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	102	[39]	7.4	[25]	0.7	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-12	LEVEL 1	1E16	(N) AHU-1	REHEAT	565	[270]	700	[4]	0.2	[50]	55	[13]	89	[32]	20.8	[71]	2.1	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-13	LEVEL 1	1E15,1E19, 1E20	(N) AHU-1	REHEAT	650	[310]	700	[4]	0.2	[50]	55	[13]	72	[22]	12.0	[41]	1.2	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-14	LEVEL 1	1E21	(N) AHU-1	NO REHEAT	0	[ ]	700	[4]	0.2	[50]	55	[13]	75	[24]	0.0	[ ]	0.0	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-15	LEVEL 1	1D01	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	100	[38]	7.1	[24]	0.7	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-16	LEVEL 1	1D02	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-17	LEVEL 1	1D03 & 3A	(N) AHU-1	REHEAT	455	[210]	700	[4]	0.2	[50]	55	[13]	87	[31]	15.8	[54]	1.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-18	LEVEL 1	1D04	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-19	LEVEL 1	1D05	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-20	LEVEL 1	1D-1, 1D13 & 14	(N) AHU-1	REHEAT	310	[150]	700	[4]	0.2	[50]	55	[13]	85	[29]	10.1	[34]	1.0	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-21	LEVEL 1	1D10, 1D11, 11A, B & C	(N) AHU-1	REHEAT	100	[47]	700	[4]	0.2	[50]	55	[13]	87	[31]	3.5	[12]	0.5	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-22	LEVEL 1	1D-3, 1D15	(N) AHU-1	REHEAT	300	[140]	700	[4]	0.2	[50]	55	[13]	87	[31]	10.4	[36]	1.0	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-23	LEVEL 1	1D16	(N) AHU-1	REHEAT	555	[260]	700	[4]	0.2	[50]	55	[13]	87	[31]	19.3	[66]	1.9	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-24	LEVEL 1	1D17	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-25	LEVEL 1	1D18	(N) AHU-1	REHEAT	145	[68]	700	[4]	0.2	[50]	55	[13]	92	[33]	5.8	[20]	0.6	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-26	LEVEL 1	1E17	(N) AHU-1	NO REHEAT	500	[240]	700	[4]	0.2	[50]	55	[13]	95	[35]	21.7	[74]	0.0	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
SAV-1-27	LEVEL 1	1E18	(N) AHU-1	REHEAT	65	[31]	700	[4]	0.2	[50]	55	[13]	95	[35]	2.8	[10]	0.5	[ ]	160	[71]	140	[60]	0.1	[ ]	N/A	---
PHC-1	Mechanical Rm.	AHU-1	(N) AHU-1	PREHEAT	12000	[5700]	500	[3]	0.02	[5]	31	[-1]	34	[1]	39	[130]	4	[ ]	160	[71]	140	[60]	12.14	[36]	N/A	MAT = 57, Not Required. Winter < 32, Requires PHC.

AIR HANDLING UNIT SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	TYPE	AIR FLOW	SUPPLY CFM	SUPPLY [L/s]	MIN OA CFM	MIN OA [L/s]	RETURN CFM	RETURN [L/s]	SUPPLY FAN MARK	RETURN OR RELIEF FAN MARK	EXHAUST FAN MARK	PREFILTER MARK	AFTER FILTER MARK	FINAL FILTER MARK	HEAT RECOVERY MARK	PREHEAT COIL MARK	COOLING COIL MARK	REHEAT COIL	HUMIDIFIER MARK	REMARKS
AHU-1	IE19	CLC	DRAW THRU	VAV	23900	[11000]	7410	[3500]	15015	[7100]	SF-1	RF-1	N/A	FF-1	–	FF-2	N/A	PHC-1	CC-1	–	HU-1 (57LB/HR)	1,2,3

NOTES:

1. FAN Selected FOR 26,400 CFM. UNIT SIZED FOR PHASE 1, PARTIAL PHASE 2 & 3. Phase 1 = 12,600 CFM. Supply & 31% Min. Outside air.
2. SF-1 (4) 2 hp FAN ARRAY W/ (1) 10 hp VFD.
3. RF-1 (4) 6.5 hp FAN ARRAY W/ (1) 25 hp VFD.

AIR FILTER SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	MERV RATING	AIR FLOW CFM	AIR FLOW [L/s]	APD INITIAL IN	APD INITIAL [mm]	APD CHANGEOVER IN	APD CHANGEOVER [mm]	HOUSING TYPE	CARTRIDGES #	CARTRIDGES SIZE IN	CARTRIDGES SIZE [mm]	ARRANGEMENT	REMARKS
FF-1	1E19	ALL	AHU-1	8	23900	[11000]	0.25	[6]	0.5	[13]	Holding Frame	6	12 x 24 x 2	[600 x 600 x 50]	1 WIDE BY 6 HIGH	-----
FF-2	1E19	ALL	AHU-1	11	23900	[11000]	0.65	[16]	1.3	[33]	Holding Frame	6	12 x 24 x 12	[600 x 600 x 50]	1 WIDE BY 6 HIGH	----

FAN SCHEDULE

MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	AIR FLOW CFM	AIR FLOW [L/s]	TSP IN	TSP [Pa]	FAN TYPE	WHEEL	CLASS	ARRANGEMENT, ROTATION, AND DISCHARGE	DIAMETER IN	DIAMETER [mm]	MIN % EFF	DRIVE	FAN MAX RPM	NOMINAL POWER BHP	NOMINAL POWER HP	NOMINAL POWER [kW]	PHASE	VOLT	RPM	SPEED CONTROL	CONTROL SEQUENCE	REMARKS
EF-1	ROOF	WEST WING	TOILET EXHAUST	600	[280]	1	[250]	CENTRIFUGAL	BI	I	CW ROTATION, UPBLAST	12	[300]	61%	BELT	1820		1/4	[ ]	3	460	1725	MANUAL		Greenheck CUBE-99HP
EF-2	ROOF	NORTH WING	TOILET EXHAUST	825	[390]	1	[250]	CENTRIFUGAL	BI	I	CW ROTATION, UPBLAST	12	[300]	59%	BELT	1725		1/4	[ ]	3	460	1725	MANUAL		Greenheck CUBE-101HP

AIR DEVICE SCHEDULE (SUPPLY)

MARK	TYPE	AIR FLOW MIN CFM	AIR FLOW MIN [L/s]	AIR FLOW MAX CFM	AIR FLOW MAX [L/s]	MAX APD IN WG	MAX APD [Pa]	MOUNTING	PANEL/FRAME SIZE IN x IN	PANEL/FRAME SIZE [mm x mm]	NECK SIZE IN	NECK SIZE [mm]	NC	DAMPER	FINISH	REMARKS
SD-11	LOUVERED FACE	40	[19]	100	[47]	0.092	[23]	CEILING	24 x 24	[600 x 600]	6 ø	[152 ø]	16	NONE	WHITE	--
SD-12	LOUVERED FACE	100	[47]	245	[120]	0.080	[20]	CEILING	24 x 24	[600 x 600]	8 ø	[203 ø]	21	NONE	WHITE	--
SD-13	LOUVERED FACE	245	[120]	350	[170]	0.092	[23]	CEILING	24 x 24	[600 x 600]	10 ø	[254 ø]	22	NONE	WHITE	--
SD-14	LOUVERED FACE	350	[170]	470	[220]	0.085	[21]	CEILING	24 x 24	[600 x 600]	12 ø	[305 ø]	22	NONE	WHITE	--
WSD-1	LOUVERED FACE	100	[47]	135	[64]	0.029	[7]	SIDEWALL	11.75 x 7.75	[298 x 171]	10 x 6	[254 x 152]	–	NONE	WHITE	--
SD-51	SUPPLY REGISTER	80	[38]	120	[57]	0.100	[25]	WALL	8 x 8	[203 x 203]	6 x 6	[152 x 152]	25	OBD	WHITE	--
SD-52	SUPPLY REGISTER	80	[38]	160	[76]	0.090	[23]	WALL	12 x 8	[305 x 203]	10 x 6	[254 x 152]	25	OBD	WHITE	--
SD-53	SUPPLY REGISTER	130	[61]	350	[170]	0.080	[20]	WALL	14 x 10	[356 x 254]	12 x 8	[305 x 203]	26	OBD	WHITE	--
SD-54	SUPPLY REGISTER	200	[94]	500	[240]	0.100	[25]	WALL	14 x 12	[356 x 305]	12 x 10	[305 x 254]	26	OBD	WHITE	--
SD-55	SUPPLY REGISTER	400	[190]	700	[330]	0.080	[20]	WALL	18 x 12	[508 x 305]	18 x 10	[457 x 254]	26	OBD	WHITE	--
SD-56	SUPPLY REGISTER	360	[170]	700	[330]	0.070	[18]	WALL	18 x 18	[457 x 457]	16 x 16	[406 x 406]	27	OBD	WHITE	--
SD-57	SUPPLY REGISTER	560	[260]	1100	[520]	0.070	[18]	WALL	22 x 22	[560 x 560]	20 x 20	[508 x 508]	28	OBD	WHITE	--
SD-58	SUPPLY REGISTER	1250	[590]	3000	[1400]	0.100	[25]	WALL	32 x 32	[813 x 813]	30 x 30	[762 x 762]	36	OBD	WHITE	--

NOTES

1. SEE DETAIL FOR DAMPER IN BRANCH DUCT SERVING EACH DIFFUSER.
2. PROVIDE SQUARE TO ROUND ADAPTER.

AIR DEVICE SCHEDULE (RETURN)

MARK	TYPE	AIR FLOW MIN CFM	AIR FLOW MIN [L/s]	AIR FLOW MAX CFM	AIR FLOW MAX [L/s]	MAX APD IN WG	MAX APD [Pa]	MOUNTING	PANEL/FRAME SIZE IN x IN	PANEL/FRAME SIZE [mm x mm]	NECK SIZE IN x IN	NECK SIZE [mm x mm]	NC	DAMPER	FINISH	REMARKS
RG-21	PERFORATED	60	[28]	100	[47]	0.090	23.000	CEILING	24 x 24	[600 x 600]	6 ø	[152 ø]	–	NONE	WHITE	-----
RG-22	PERFORATED	100	[47]	175	[83]	0.090	23.000	CEILING	24 x 24	[600 x 600]	8 ø	[203 ø]	13	NONE	WHITE	-----
RG-23	PERFORATED	175	[83]	275	[130]	0.090	23.000	CEILING	24 x 24	[600 x 600]	10 ø	[254 ø]	16	NONE	WHITE	-----
RG-24	PERFORATED	275	[130]	390	[180]	0.090	23.000	CEILING	24 x 24	[600 x 600]	12 ø	[305 ø]	17	NONE	WHITE	-----
RG-25	PERFORATED	1000	[470]	1340	[630]	0.060	15.000	CEILING	24 x 24	[600 x 600]	22 X 22	[559 x 559]	20	NONE	WHITE	-----
WRG-1	LOUVERED	120	[57]	165	[78]	0.023	5.800	SIDEWALL	13.75 x 7.75	[349 x 196]	12 x 6	[305 x 152]	–	NONE	WHITE	-----
RR-51	RETURN REGISTER	130	[61]	210	[99]	0.078	20.000	WALL	10 x 10	[254 x 254]	8 x 8	[203 x 203]	13	OBD	WHITE	-----
RR-52	RETURN REGISTER	200	[94]	330	[160]	0.078	20.000	WALL	12 x 12	[305 x 305]	10 x 10	[254 x 254]	15	OBD	WHITE	-----
RR-53	RETURN REGISTER	270	[130]	440	[210]	0.078	20.000	WALL	14 x 14	[356 x 356]	12 x 12	[305 x 305]	17	OBD	WHITE	-----
RR-54	RETURN REGISTER	250	[120]	610	[290]	0.082	21.000	WALL	16 x 16	[406 x 406]	14 x 14	[356 x 356]	18	OBD	WHITE	-----
RR-55	RETURN REGISTER	320	[150]	810	[380]	0.082	21.000	WALL	18 x 18	[457 x 457]	16 x 16	[406 x 406]	19	OBD	WHITE	-----
RR-56	RETURN REGISTER	90	[42]	160	[76]	0.078	20.000	WALL	10 x 8	[254 x 203]	8 x 6	[203 x 152]	12	OBD	WHITE	-----
RR-57	RETURN REGISTER	140	[66]	240	[110]	0.078	20.000	WALL	14 x 8	[356 x 203]	12 x 6	[305 x 152]	14	OBD	WHITE	-----
RR-58	RETURN REGISTER	210	[99]	350	[170]	0.078	20.000	WALL	20 x 8	[508 x 203]	18 x 6	[457 x 152]	16	OBD	WHITE	-----
RR-59	RETURN REGISTER	190	[90]	320	[150]	0.078	20.000	WALL	14 x 10	[356 x 254]	12 x 8	[305 x 203]	15	OBD	WHITE	-----
RR-510	RETURN REGISTER	220	[100]	360	[170]	0.078	20.000	WALL	14 x 12	[356 x 305]	12 x 10	[305 x 254]	16	OBD	WHITE	-----
RR-511	RETURN REGISTER	330	[160]	560	[260]	0.078	20.000	WALL	20 x 12	[508 x 305]	18 x 10	[457 x 254]	17	OBD	WHITE	-----
RR-512	RETURN REGISTER	360	[170]	850	[400]	0.082	21.000	WALL	26 x 14	[660 x 356]	24 x 12	[600 x 305]	20	OBD	WHITE	-----
RR-513	RETURN REGISTER	460	[220]	1260	[590]	0.095	24.000	WALL	32 x 14	[813 x 356]	30 x 12	[762 x 305]	24	OBD	WHITE	-----

NOTE

1. PROVIDE SQUARE TO ROUND ADAPTER.

AIR DEVICE SCHEDULE (EXHAUST)

MARK	TYPE	AIR FLOW MIN CFM	AIR FLOW MIN [L/s]	AIR FLOW MAX CFM	AIR FLOW MAX [L/s]	MAX APD IN WG	MAX APD [Pa]	MOUNTING	PANEL/FRAME SIZE IN x IN	PANEL/FRAME SIZE [mm x mm]	NECK SIZE IN x IN	NECK SIZE [mm x mm]	NC	DAMPER	FINISH	REMARKS
EG-21	PERFORATED	60	[28]	100	[47]	0.090	23.000	CEILING	24 x 24	[600 x 600]	6 ø	[152 ø]	12	NONE	WHITE	-----
EG-22	PERFORATED	60	[28]	100	[47]	0.090	23.000	CEILING	12 x 12	[600 x 600]	6 ø	[152 ø]	12	NONE	WHITE	-----

NOTE

PROVIDE SQUARE TO ROUND ADAPTER.

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions: | Date

CONSULTANTS:

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TEL: 415.362.3266
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Project Number: 120-099

REGISTERED PROFESSIONAL ENGINEER — JON ALAN INMAN — No. M31122 — EXP. 9/30/15 — MECHANICAL ENGINEER — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

POLYTECH ASSOCIATES INC
POLYTECH ASSOCIATES INC.
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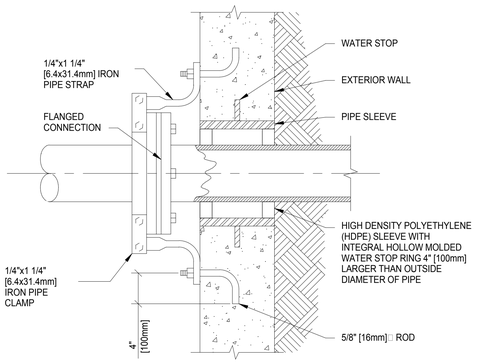
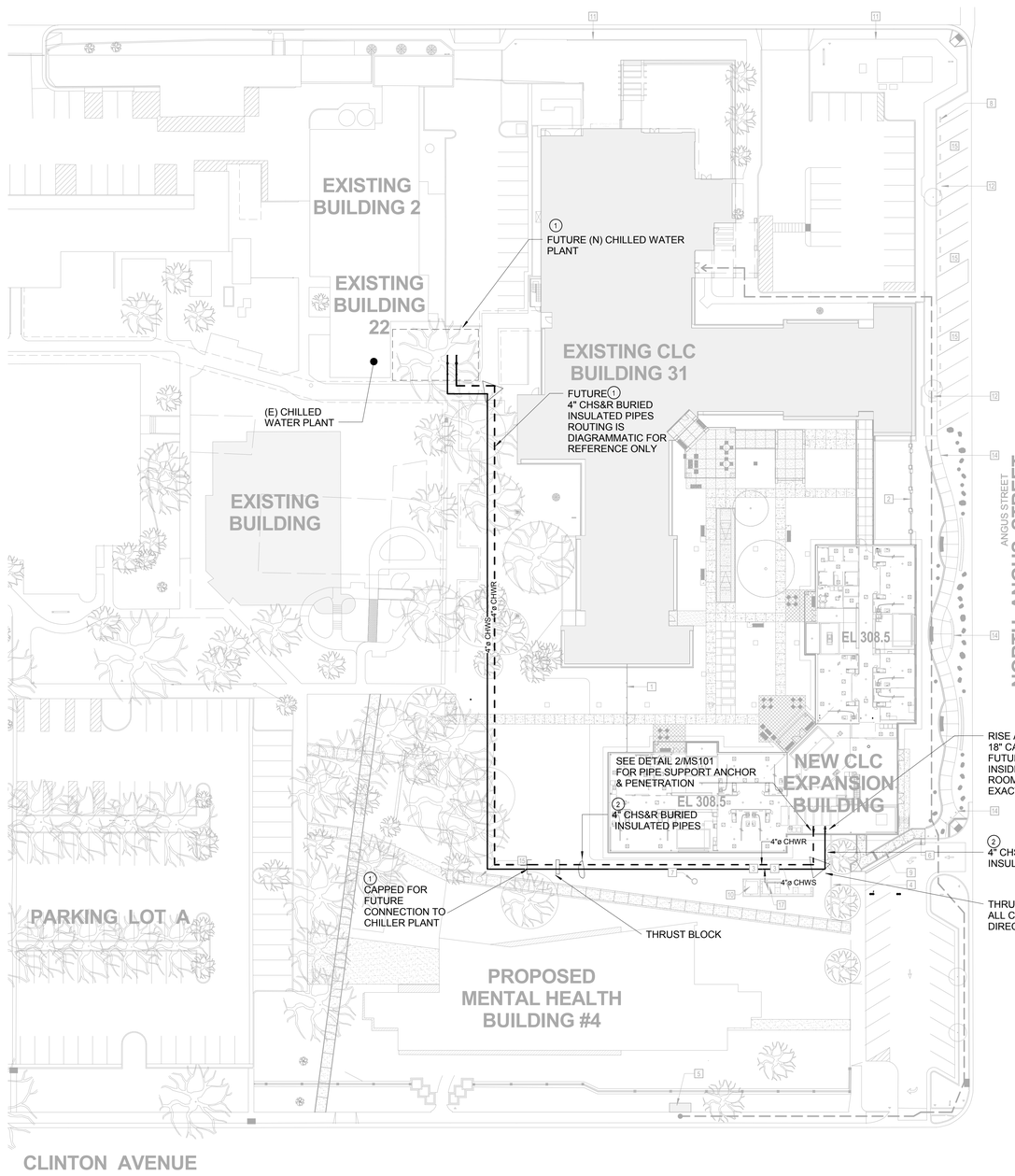
Drawing Title	MECHANICAL SCHEDULES
Approved: Project Director	
Project Title	EXPAND COMMUNITY LIVING CENTER PHASE 1
Location	2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date	OCTOBER 29, 2015
Checked	MT
Drawn	NS/GL
Project Number	570-218
Building Number	31
Drawing Number	M103
Dwg. of	

Office of Construction and Facilities Management
Department of Veterans Affairs



2 SUPPORT ANCHOR (CHILLED WATER)
NTS



1 MECHANICAL SITE PLAN
1/32" = 1'-0"

N

GENERAL SHEET NOTES

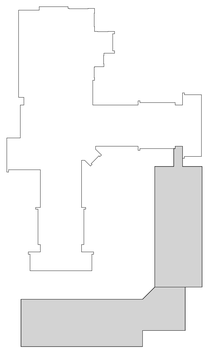
1. REFER TO CS101 FOR ADDITIONAL REQUIREMENTS.
2. REFER TO 9/CS801 FOR TRENCHING AND BACKFILL.

KEY NOTES

1 FUTURE CONNECTION TO THE (N) CHILLER PLANT IN PROJECT 570-13-300 BY HFP.

2 MINIMUM 30" COVER.COORDINATE LOCATION WITH CIVIC DRAWINGS. RECORD THE PIPE CENTERLINE AND LOCATION OF CAPPED PIPE FOR FUTURE CONNECTION.

KEY PLAN



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REGISTERED PROFESSIONAL ENGINEER — No. M31122 EXP: 09/30/15 — MECHANICAL — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

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Drawing Title: MECHANICAL SITE PLAN

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

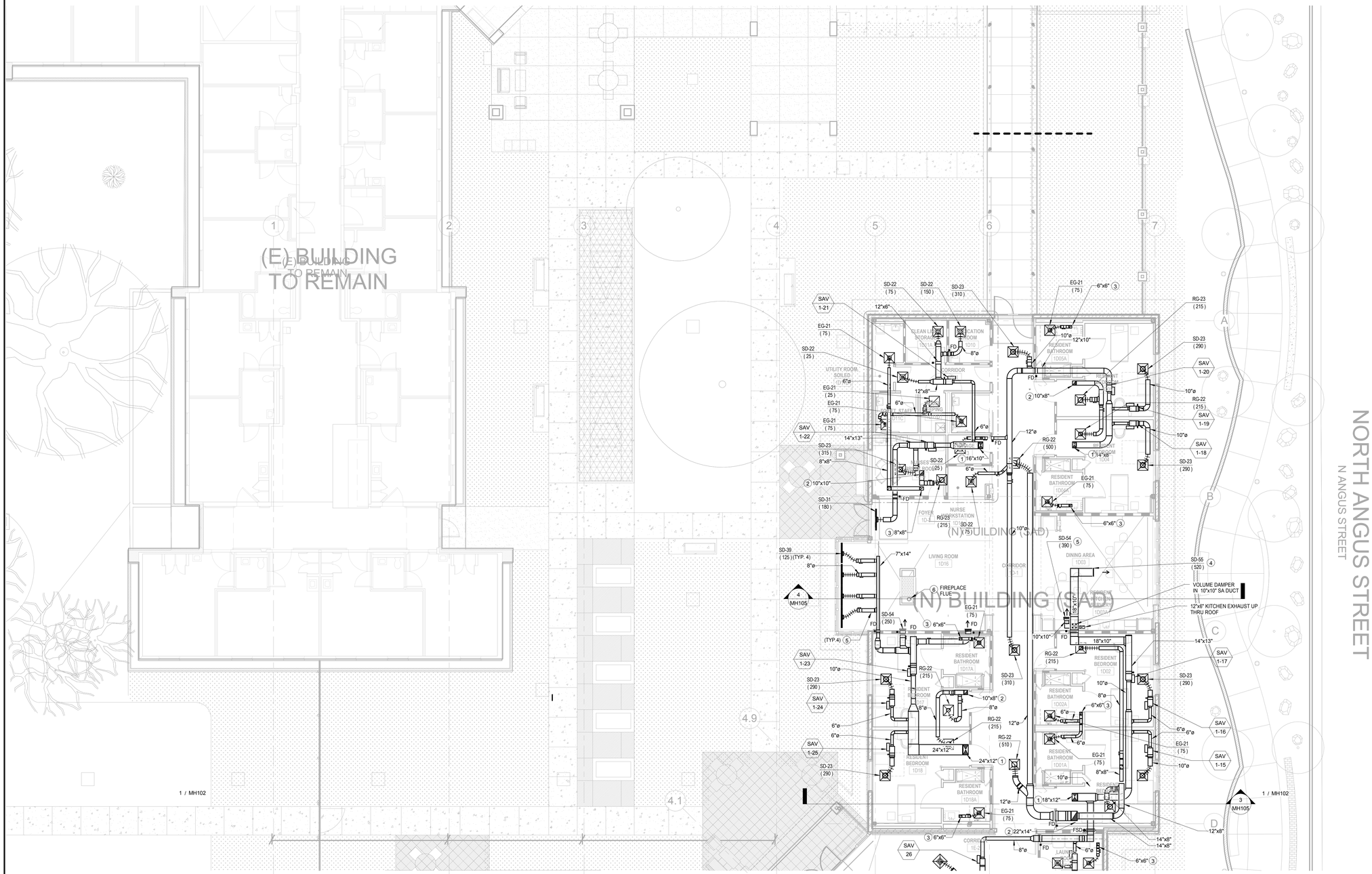
Drawing Number: MS101

Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231



1 MECHANICAL FLOOR PLAN - NORTH WING
1/8" = 1'-0"

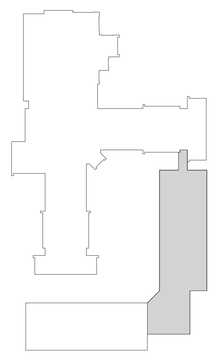
GENERAL SHEET NOTES

1. REFER TO M4.01 FOR DUCT DETAILS.
2. SEE MECHANICAL PIPING PLANS PLAN MP101 & MP102 FOR THERMOSTAT LOCATIONS.
3. ALL FINAL BRANCHES SHALL BE FITTED WITH A VOLUME DAMPER.
4. DUCTWORK OFFSETS INTO BEAMSPACE SHALL BE PROVIDED AS NECESARY. WHERE NEEDED FOR SERVICES RUNNING BELOW. SOME OFFSETS HAVE BEEN SHOWN ON THE DRAWINGS. IF ADDITIONAL ARE NEEDED FOR COORDINATION PURPOSES, THESE SHALL BE PROVIDED.
5. ELBOWS & REDUCER SHALL BE THREE DIAMETERS UPSTREAM OF SAV BOXES.
6. PROVIDE ACCESS DOOR (NOT SHOWN) IN DUCTWORK AT ALL FD'S AND FSD'S TO RESET OR MANTAIN. WHERE POSSIBLE, ARRANGE OPERATOR AND PROVIDE ACCESS FROM OUTSIDE ROOM SIDE.
7. DUCTWORK SHOWN RISING UP IS GENERALLY ROUTED UP TO ATTIC SPACE. COORDINATE PENETRATION LOCATIONS WITH STRUCTURAL.

KEY NOTES

1. SUPPLY AIR DUCT UP TO ATTIC.
2. RETURN AIR DUCT UP TO ATTIC.
3. EXHAUST AIR DUCT UP TO ATTIC.
4. SIDEWALL GRILLE TO BE PLACED ON VERTICAL FACE 10' SOFFIT.
5. SIDEWALL GRILLE TO BE PLACED ON VERTICAL FACE ABOVE KITCHEN CABINET. ARCHITECT TO PROVIDE ACCESS TO VOLUME DAMPER.
6. PROVIDE FIRE PLACE FLUE PER APPROVED FIRE PLACE MANUFACTURER'S REQUIREMENTS. DEDUCT ALTERNATE #5.

KEY PLAN



100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions:	Date

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PROJECT NUMBER: 120-099

REGISTERED PROFESSIONAL ENGINEER — No. M31122 — EXP. 09/30/15 — MECHANICAL — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

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Drawing Title: MECHANICAL FLOOR PLAN - NORTH WING

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

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Dwg. of

Office of Construction and Facilities Management

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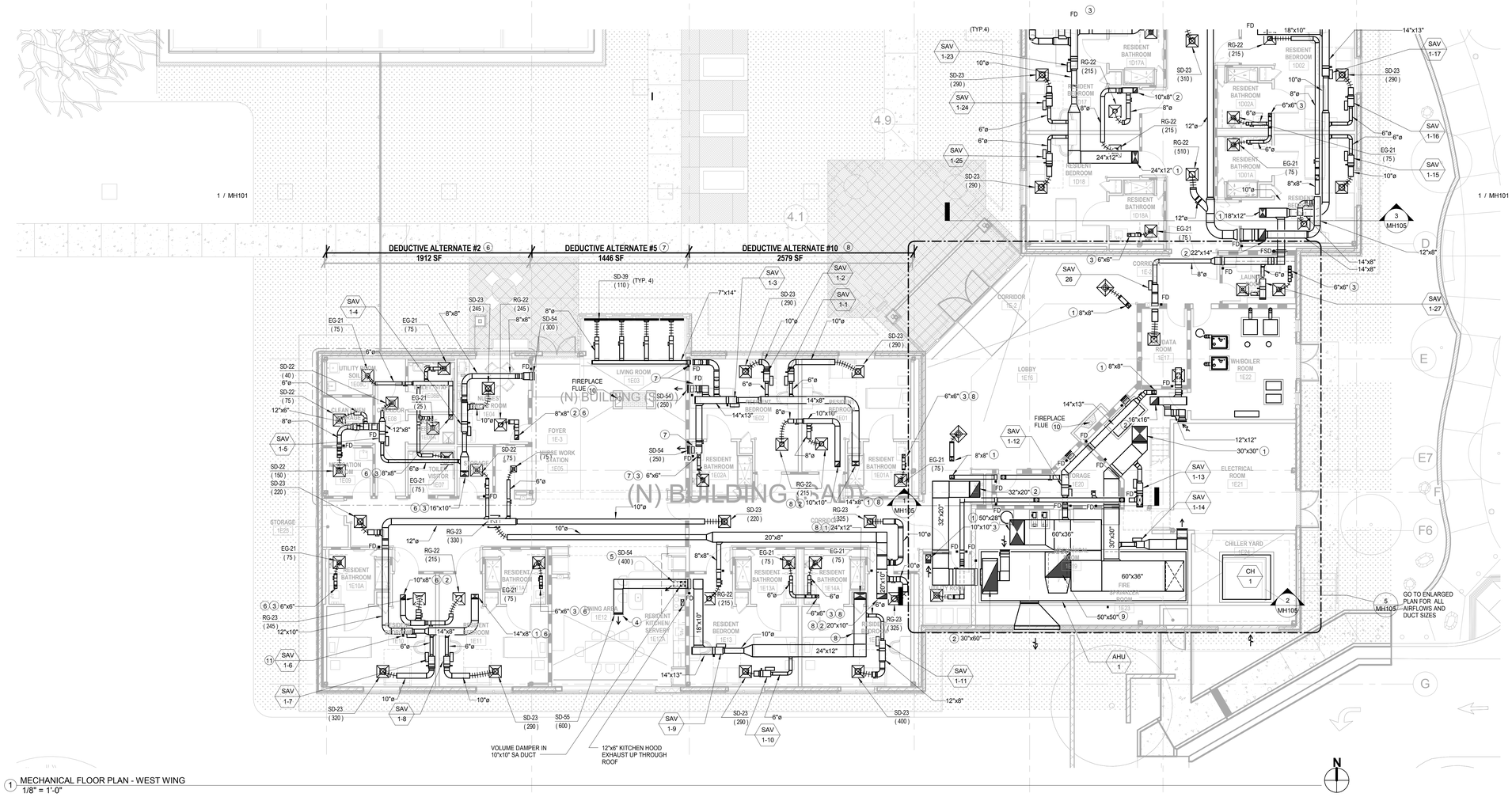
VA FORM 08-6231



1 MECHANICAL FLOOR PLAN - WEST WING
1/8" = 1'-0"

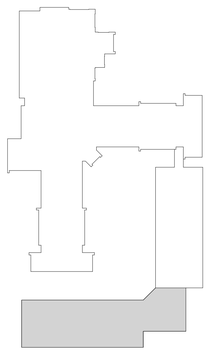
GENERAL SHEET NOTES

1. REFER TO M4.01 FOR DUCT DETAILS.
2. SEE MECHANICAL PIPING PLANS PLAN MP101 & MP102 FOR THERMOSTAT LOCATIONS.
3. ALL FINAL BRANCHES SHALL BE FITTED WITH A VOLUME DAMPER.
4. DUCTWORK OFFSETS INTO BEAMSPACE SHALL BE PROVIDED AS NECESARY, WHERE NEEDED FOR SERVICES RUNNING BELOW. SOME OFFSETS HAVE BEEN SHOWN ON THE DRAWINGS. IF ADDITIONAL ARE NEEDED FOR COORDINATION PURPOSES, THESE SHALL BE PROVIDED.
5. ELBOWS & REDUCER SHALL BE THREE DIAMETERS UPSTREAM OF SAV BOXES.
6. PROVIDE ACCESS DOOR (NOT SHOWN) IN DUCTWORK AT ALL FD'S AND FSD'S TO RESET OR MANTAIN. WHERE POSSIBLE, ARRANGE OPERATOR AND PROVIDE ACCESS FROM OUTSIDE ROOM SIDE.
7. DUCTWORK SHOWN RISING UP IS GENERALLY ROUTED UP TO ATTIC SPACE. COORDINATE PENETRATION LOCATIONS WITH STRUCTURAL.

KEY NOTES

1. SUPPLY AIR DUCT UP TO ATTIC.
2. RETURN AIR DUCT UP TO ATTIC SPACE.
3. EXHAUST AIR DUCT UP TO ATTIC SPACE.
4. SIDEWALL GRILLE TO BE PLACED ON VERTICAL FACE 9' SOFFIT.
5. SIDEWALL GRILLE TO BE PLACED ON VERTICAL ABOVE KITCHEN CABINET. ARCHITECT TO PROVIDE ACCESS TO VOLUME DAMPER.
6. DEDUCTIVE ALTERNATE #2 - REFER TO 1/AS201D. CAP ALL DUCTS DN. FROM ATTIC BELOW SLAB PENETRATION UNLESS OTHERWISE NOTED. ALL DUCTS AND EQUIPMENT WEST OF COLUMN LINE 2 NOT TO BE INSTALLED.
7. DEDUCTIVE ALTERNATE #5 - REFER TO 2/AS201D CAP ALL DUCTS DN. FROM ATTIC BELOW SLAB PENETRATION UNLESS OTHERWISE NOTED. ALL DUCTS AND EQUIPMENT WEST OF COLUMN LINE 3 NOT TO BE INSTALLED.
8. DEDUCTIVE ALTERNATE #10 - REFER TO 3/AS201D CAP ALL DUCTS DN. FROM ATTIC BELOW SLAB PENETRATION UNLESS OTHERWISE NOTED. ALL DUCTS AND EQUIPMENT WEST OF COLUMN LINE 4 NOT TO BE INSTALLED.
9. 50x50 OUTSIDE AIR DUCT UP TO ATTIC SPACE.
10. PROVIDE FIREPLACE FLUE PER APPROVED FIRE PLACE MANUFACTURERS REQUIREMENTS. DEDUCT ALTERNATE #5.
11. RELOCATE SAV-1-6 IF DEDUCTIVE ALTERNATE #2 IS ACCEPTED. LOCATE SAV-1-6 BETWEEN COL. 3 & 4.

KEY PLAN



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NOVEMBER 19, 2015

Revisions:	Date

CONSULTANTS:

MAZZETTI
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TEL: 415.632.3266
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PROJECT NUMBER: 120-099

REGISTERED PROFESSIONAL ENGINEER — No. M31122 EXP. 09/30/15 — MECHANICAL — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

POLYTECH ASSOCIATES INC.
235 Pine Street, 17th Floor
San Francisco, CA 94104
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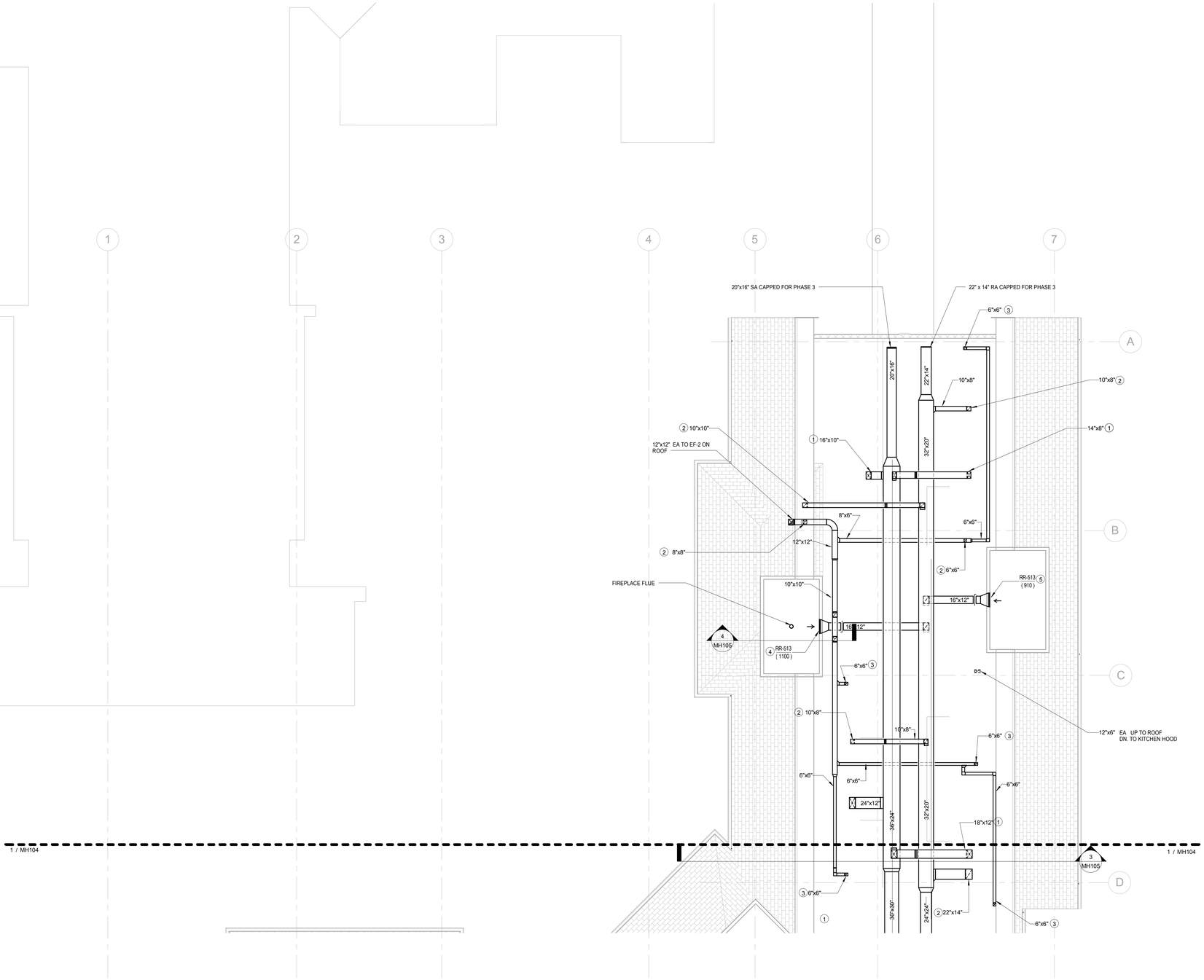
FAX (415) 397-1517

Drawing Title	MECHANICAL FLOOR PLAN - WEST WING
Approved: Project Director	
Project Title	EXPAND COMMUNITY LIVING CENTER PHASE 1
Location	2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date	OCTOBER 29, 2015
Checked	MT
Drawn	NS/GL
Project Number	570-218
Building Number	31
Drawing Number	MH102
Dwg. of	

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231



1 MECHANICAL ATTIC PLAN - NORTH WING
1/8" = 1'-0"

N

GENERAL SHEET NOTES

1. REFER TO M4.01 FOR DUCT DETAILS.
2. ELBOWS & REDUCER SHALL BE THREE DIAMETERS UPSTREAM OF SAV BOXES.
3. DUCTWORK SHOWN GOING DOWN IS ROUTED UP TO 1ST FLOOR. COORDINATE PENETRATION LOCATIONS WITH STRUCTURAL.

KEY NOTES

1. SUPPLY AIR DUCT DN. TO 1ST FLR.
2. RETURN AIR DUCT DN. TO 1ST FLR.
3. EXHAUST AIR DUCT DN. TO FIRST FLOOR.
4. 30"x12" RA GRILLE SERVING LIVING ROOM RM. 1D16
5. 30"x12" RA GRILLE SERVING DINING AREA RM. 1D03

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NOVEMBER 19, 2015

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REGISTERED PROFESSIONAL ENGINEER — No. M31122 — EXP. 09/30/15 — MECHANICAL — STATE OF CALIFORNIA

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POLYTECH ASSOCIATES INC

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Drawing Title: MECHANICAL ATTIC PLAN - NORTH WING

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

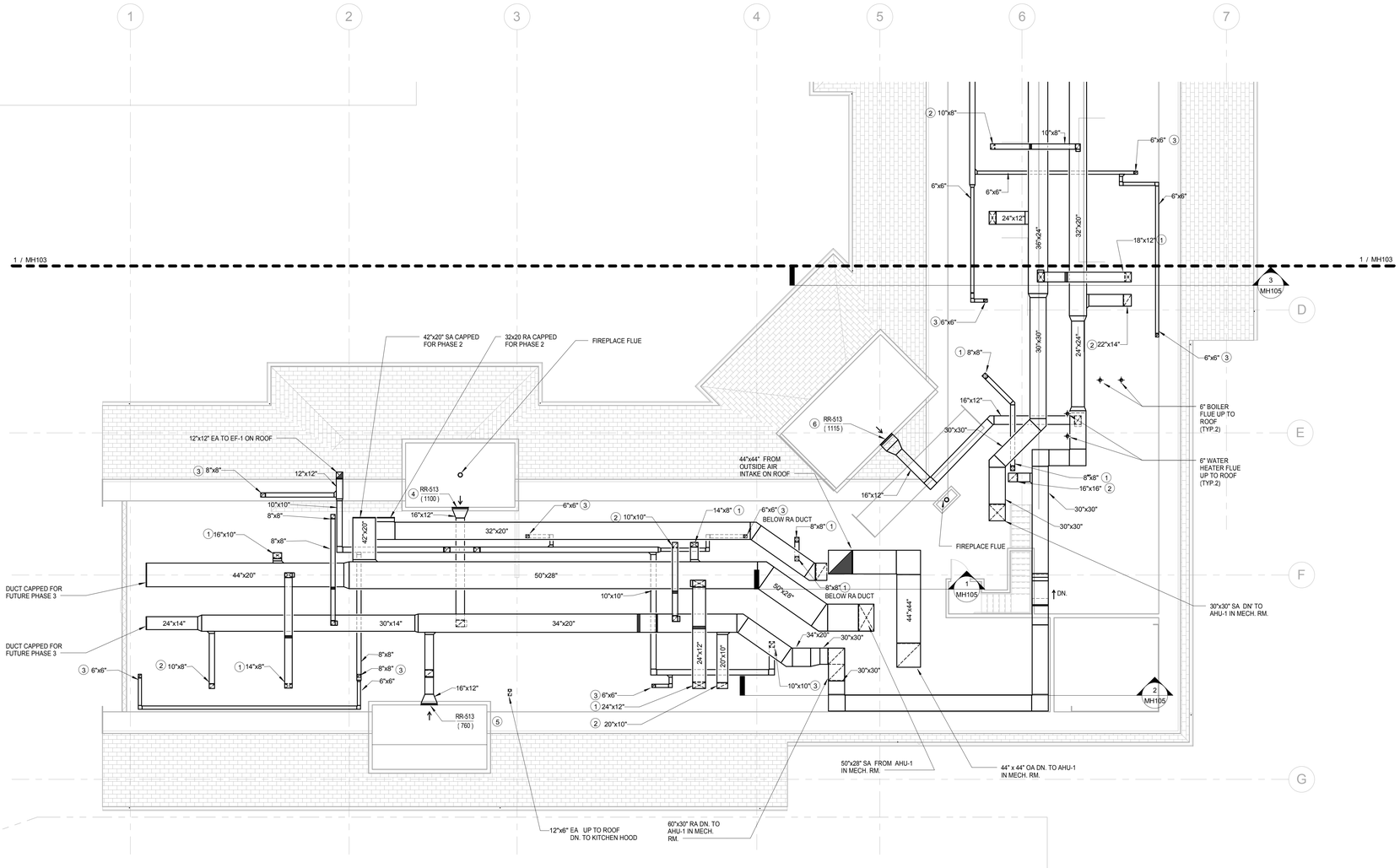
Drawing Number: MH103

Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231



1 MECHANICAL ATTIC PLAN - WEST WING
1/8" = 1'-0"

N

GENERAL SHEET NOTES

1. REFER TO M4.01 FOR DUCT DETAILS.
2. ELBOWS & REDUCER SHALL BE THREE DIAMETERS UPSTREAM OF SAV BOXES.
3. DUCTWORK SHOWN GOING DOWN IS ROUTED UP TO 1ST FLOOR. COORDINATE PENETRATION LOCATIONS WITH STRUCTURAL.

KEY NOTES

1. SUPPLY AIR DUCT DN. TO 1ST FLR.
2. RETURN AIR DUCT DN. TO FIRST FLOOR.
3. EXHAUST AIR DUCT DN. TO FIRST FLOOR.
4. 30"x12" RA GRILLE SERVING LIVING ROOM RM. 1E03
5. 30"x12" RA GRILLE SERVING DINING AREA RM. 1E12.
6. 30"x12" RA GRILLE SERVING LOBBY RM. 1E12.

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NOVEMBER 19, 2015

Revisions:	Date

CONSULTANTS:

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PROJECT NUMBER: 120-099

REGISTERED PROFESSIONAL ENGINEER — No. M31122 — EXP. 09/30/15 — MECHANICAL — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

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Drawing Title: MECHANICAL ATTIC PLAN - WEST WING

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

Drawing Number: MH104

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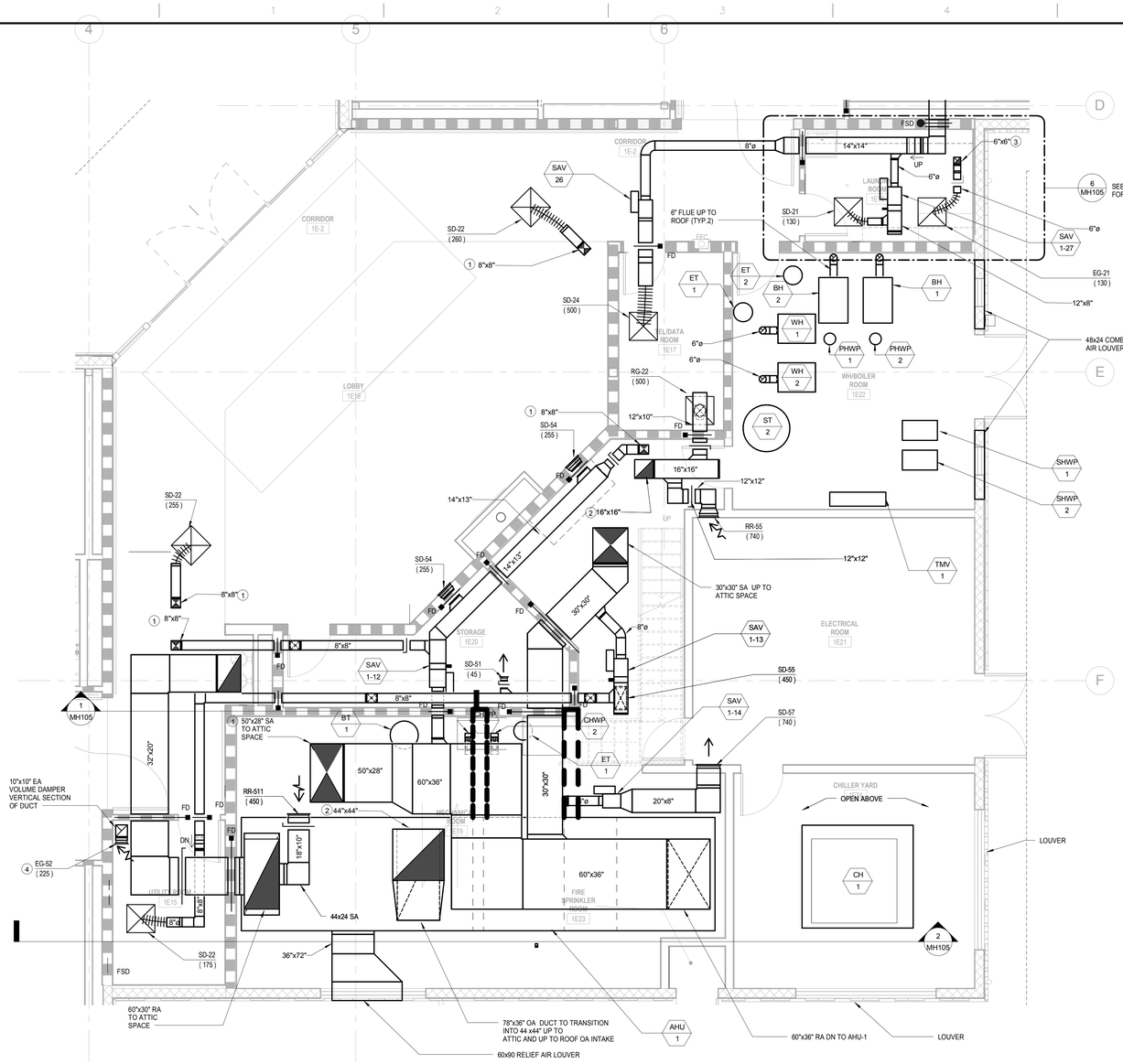
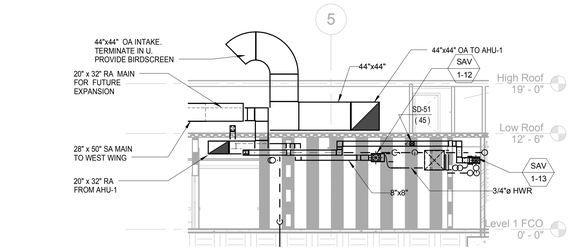
Department of Veterans Affairs

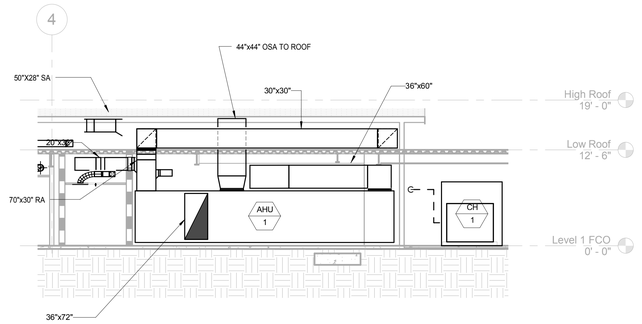
VA FORM 08-6231



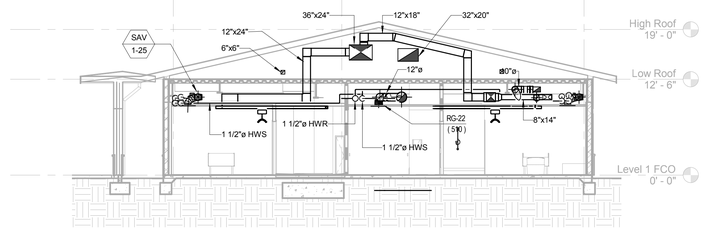
5 ENLARGED AREA
1/4" = 1'-0"



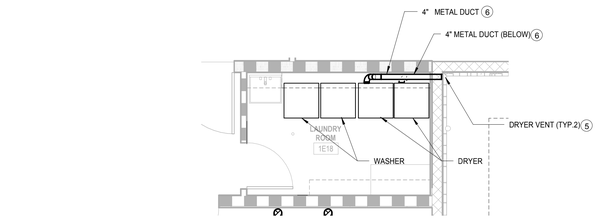
1 MECHANICAL ROOM
1/8" = 1'-0"



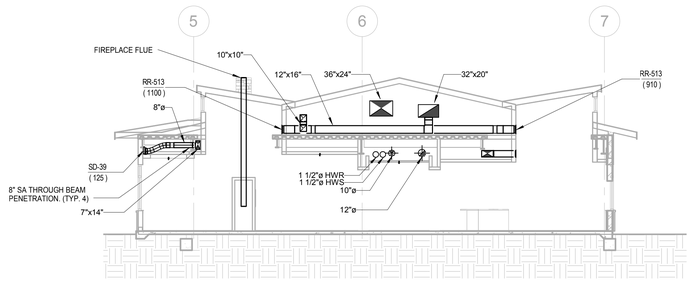
2 MECHANICAL ROOM SECTION N-S
1/8" = 1'-0"



3 NORTH WING SECTION
1/8" = 1'-0"



6 LAUNDRY ROOM DRYER VENTS
1/4" = 1'-0"



4 NORTH WING LIVNG ROOM / DINING
1/8" = 1'-0"

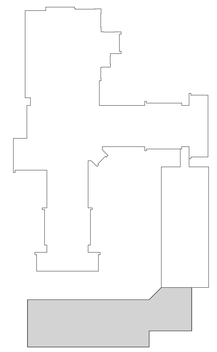
GENERAL SHEET NOTES

1. REFER TO M4.01 FOR DUCT DETAILS.
2. SEE MECHANICAL PIPING PLANS PLAN MP101 & MP102 FOR THERMOSTAT LOCATIONS.
3. ALL FINAL BRANCHES SHALL BE FITTED WITH A VOLUME DAMPER.
4. DUCTWORK OFFSETS INTO BEAMSPACE SHALL BE PROVIDED AS NECESARY, WHERE NEEDED FOR SERVICES RUNNING BELOW. SOME OFFSETS HAVE BEEN SHOWN ON THE DRAWINGS. IF ADDITIONAL ARE NEEDED FOR COORDINATION PURPOSES, THESE SHALL BE PROVIDED.
5. ELBOWS & REDUCER SHALL BE THREE DIAMETERS UPSTREAM OF SAV BOXES.
6. PROVIDE ACCESS DOOR (NOT SHOWN) IN DUCTWORK AT ALL FD'S AND FSD'S TO RESET OR MANTAIN. WHERE POSSIBLE, ARRANGE OPERATOR AND PROVIDE ACCESS FROM OUTSIDE ROOM SIDE.
7. DUCTWORK SHOWN RISING UP IS GENERALLY ROUTED UP TO ATTIC SPACE. COORDINATE PENETRATION LOCATIONS WITH STRUCTURAL.

KEY NOTES

1. SUPPLY AIR DUCT UP TO ATTIC.
2. RETURN AIR DUCT UP TO ATTIC SPACE.
3. EXHAUST AIR DUCT UP TO ATTIC.
4. LOW EXHAUST TO BE LOCATED WITHIN 1' OF FLOOR.
5. DRYER VENT DUCTS TO BE LOCATED ABOVE THE OTHER. TERMINATE AT WALL WITH EXHAUST HOOD. FOLLOW MFGR'S INSTALLATION INSTRUCTIONS.
6. 4" METAL DUCT. USE FLEXIBLE METAL DUCT IF NEEDED INSIDE LAUNDRY ROOM. FOLLOW MFGR'S INSTALLATION INSTRUCTION FOR ALLOWABLE LENGHTS, ELBOWS AND FLEXIBLE DUCT ALLOWED.

KEY PLAN



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NOVEMBER 19, 2015

Revisions:	Date

CONSULTANTS:

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PROJECT NUMBER: 120-099

REGISTERED PROFESSIONAL ENGINEER — No. M31122 EXP. 09/30/15 — MECHANICAL — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

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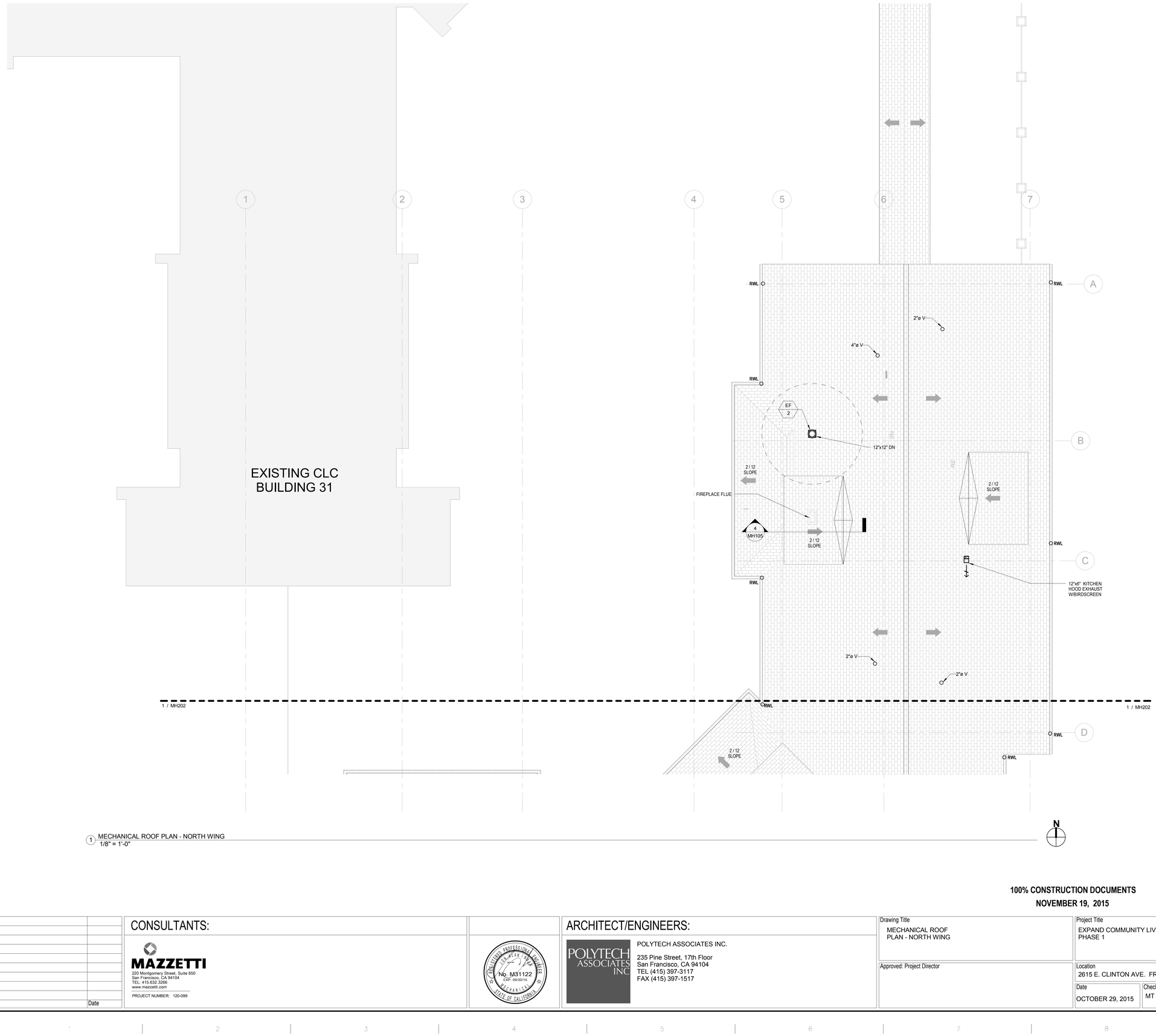
Drawing Title: ENLARGED MECHANICAL ROOM PLAN
Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1
Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date: OCTOBER 29, 2015
Checked: MT
Drawn: NS/GL

Project Number: 570-218
Building Number: 31
Drawing Number: MH105
Dwg. of

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231



1 MECHANICAL ROOF PLAN - NORTH WING
1/8" = 1'-0"

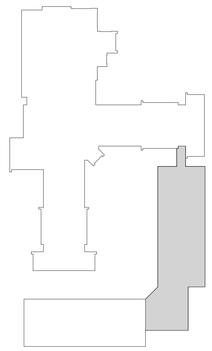
100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

GENERAL SHEET NOTES

1. REFER TO M4.01 FOR DUCT DETAILS.
2. PLUMBING VENTS SHOWN FOR REFERENCE. EXHAUSTS MUST BE A MIN. OF 10' OF VENTS OR OTHER OPENINGS.

KEY NOTES

KEY PLAN



Revisions:	Date

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REGISTERED PROFESSIONAL ENGINEER — MECHANICAL — No. M31122 EXP. 09/30/15 — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

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Drawing Title: MECHANICAL ROOF PLAN - NORTH WING

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

Drawing Number: MH201

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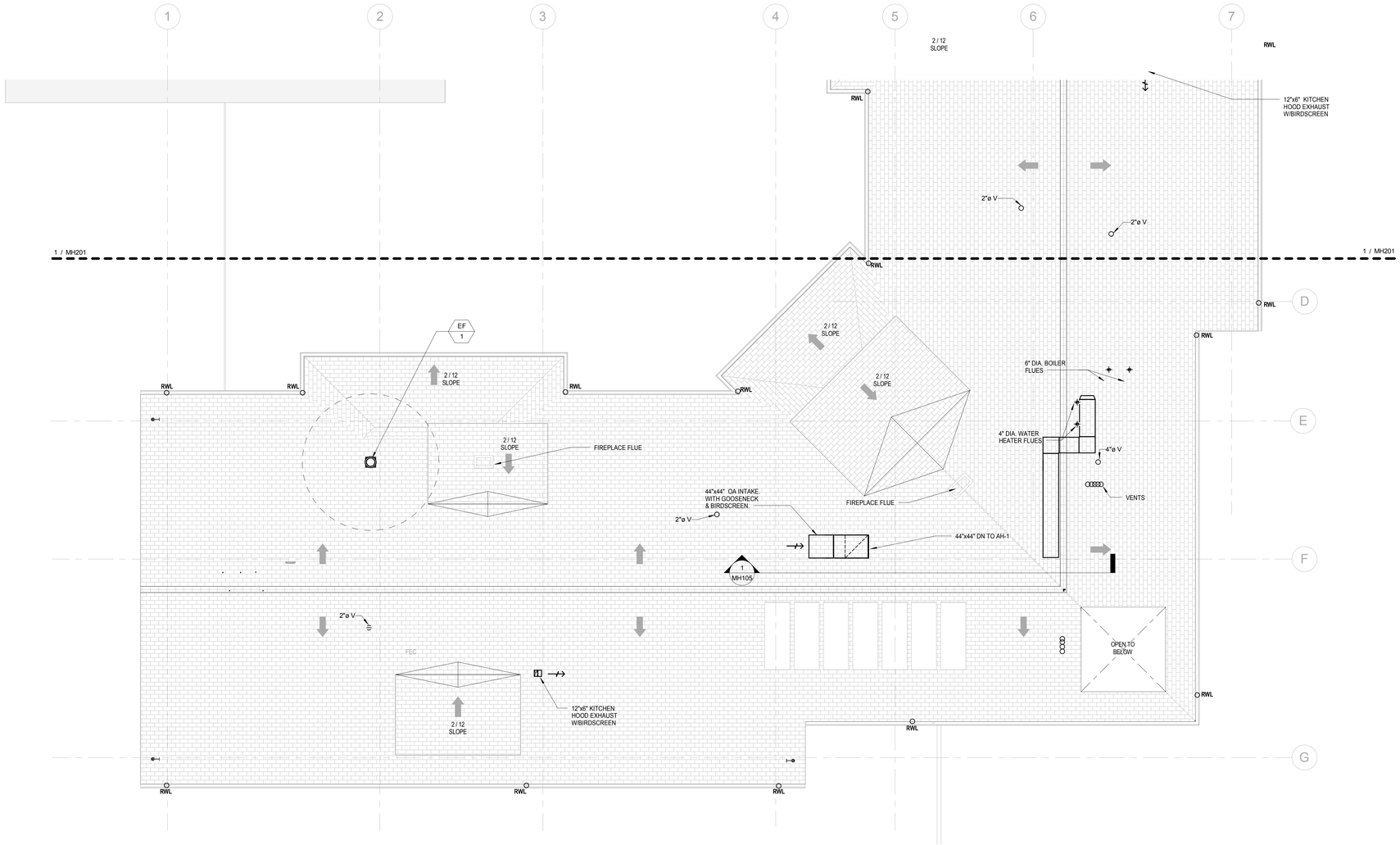
Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231



1 MECHANICAL ROOF PLAN - WEST WING
1/8" = 1'-0"

N

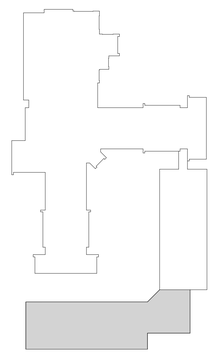
100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

GENERAL SHEET NOTES

1. REFER TO M4.01 FOR DUCT DETAILS.
2. PLUMBING VENTS SHOWN FOR REFERENCE. EXHAUSTS MUST BE A MIN. OF 10' OF VENTS OR OTHER OPENINGS.
3. EXHAUSTS MUST BE LOCATED A MIN. OF 25' OF OUTSIDE AIR INTAKE.

KEY NOTES

KEY PLAN



Revisions:	Date

CONSULTANTS:

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PROJECT NUMBER: 120-099

No. M31122 EXP. 09/30/15 MECHANICAL STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

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Drawing Title: MECHANICAL ROOF PLAN - WEST WING

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

Drawing Number: MH202

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Department of Veterans Affairs

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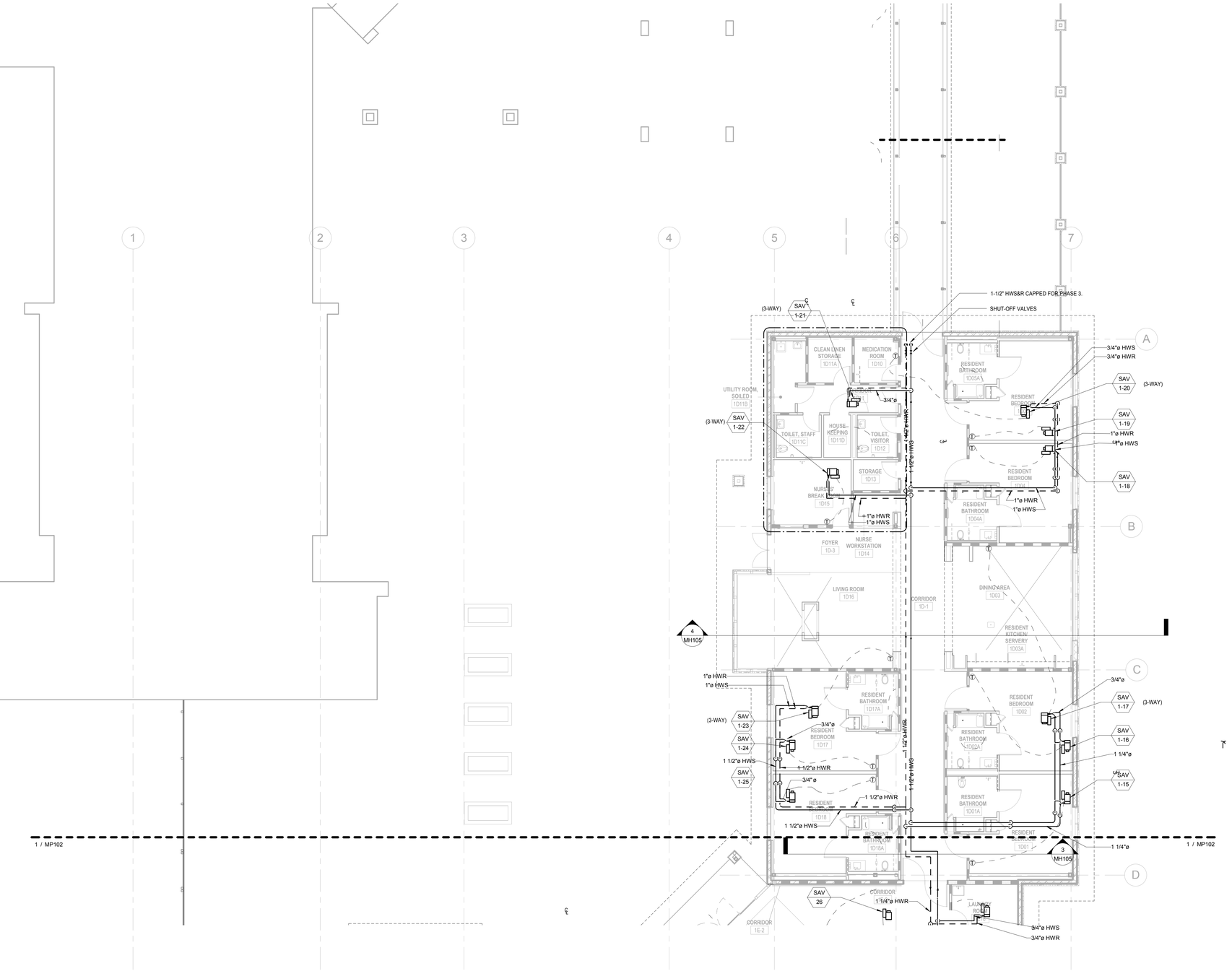


1 MECHANICAL HYDRONIC PIPING FLOOR PLAN - NORTH WING
1/8" = 1'-0"

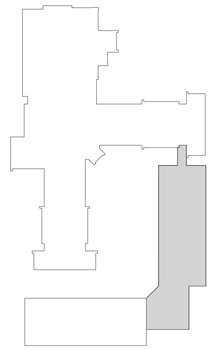
100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

GENERAL SHEET NOTES

1. REFER TO M4.02 FORPIPE HANGER DETAIL.
2. COORDINATE THERMOSTAT LOCATIONS WITH ARCHITECTURAL DRAWINGS.
3. PIPING OFFSETS INTO BEAMSPACE SHALL BE PROVIDED AS NECESARY. SOME OFFSETS HAVE BEEN SHOWN ON THE DRAWINGS. IF ADDITIONAL ARE NEEDED FOR COORDINATION PURPOSES, THESE SHALL BE PROVIDED.

KEY NOTES

KEY PLAN



Revisions:	Date

CONSULTANTS:

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PROJECT NUMBER: 120-099

REGISTERED PROFESSIONAL ENGINEER — JOHN MARK TAM — No. M31122 EXP. 09/30/15 — MECHANICAL — STATE OF CALIFORNIA

ARCHITECT/ENGINEERS:

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TEL (415) 397-3117
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Drawing Title: MECHANICAL HYDRONIC PIPING FLOOR PLAN - NORTH WING

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

Drawing Number: MP101

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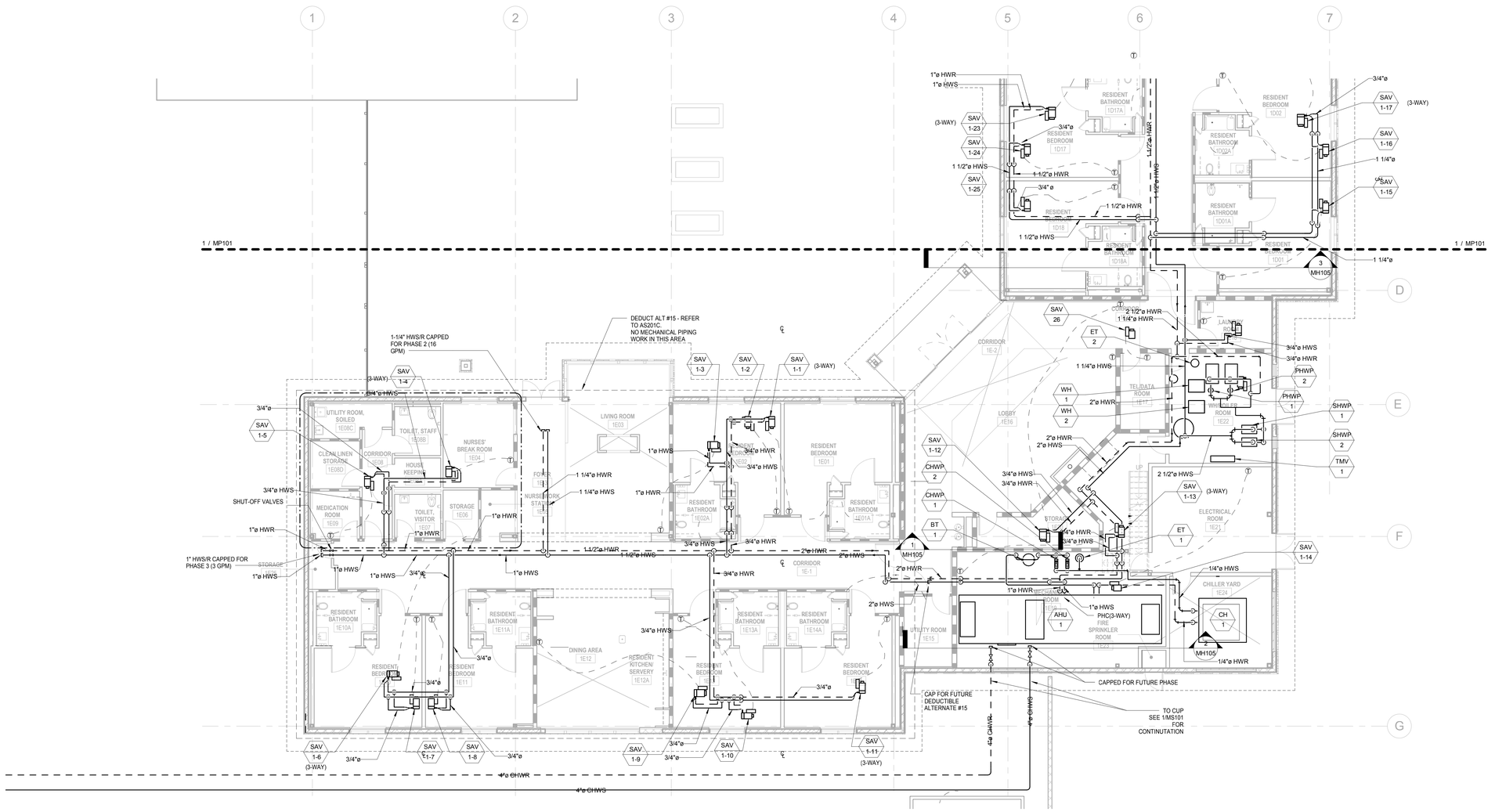


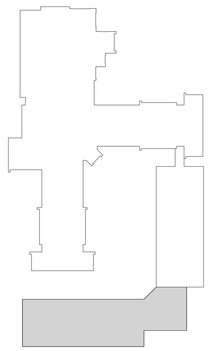
1 MECHANICAL HYDRONIC PIPING FLOOR PLAN - WEST WING
1/8" = 1'-0"

GENERAL SHEET NOTES

1. REFER TO M4.02 FORPIPE HANGER DETAIL.
2. COORDINATE THERMOSTAT LOCATIONS WITH ARCHITECTURAL DRAWINGS.
3. PIPING OFFSETS INTO BEAMSPACE SHALL BE PROVIDED AS NECESARY. SOME OFFSETS HAVE BEEN SHOWN ON THE DRAWINGS. IF ADDITIONAL ARE NEEDED FOR COORDINATION PURPOSES, THESE SHALL BE PROVIDED.
4. REFER TO M3.01 FOR BOILER AND CHILLER PIPING DIAGRAMS

KEY NOTES

KEY PLAN



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Drawing Title: MECHANICAL HYDRONIC PIPING FLOOR PLAN - WEST WING

Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1

Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223

Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218

Building Number: 31

Drawing Number: MP102

Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs

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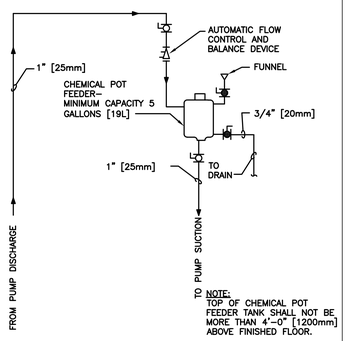
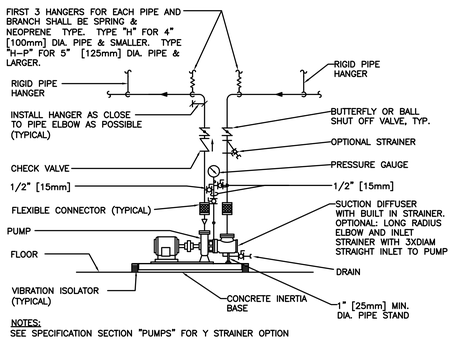


NOTE:
TOP OF CHEMICAL POT FEEDER TANK SHALL NOT BE MORE THAN 4'–0" [1200mm] ABOVE FINISHED FLOOR.

6 WATER TREATMENT – CLOSED SYSTEMS
NTS

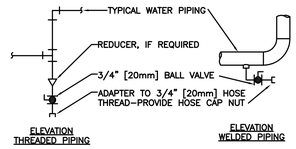
DESIGNER'S NOTE:
1. SHOW LOCATION OF ALL CHEMICAL POT FEEDER TANKS ON PIPING DIAGRAMS FOR EACH CHILLED WATER AND HEATING HOT WATER SYSTEM. FEEDER MAY ALSO BE USED FOR MAKE–UP FOR SMALL GLYCOL–WATER SYSTEMS (UNDER 50 GPM [190 LPM] IN LIEU OF A TANK/PUMP MAKE–UP SYSTEM.



NOTES:
SEE SPECIFICATION SECTION "PUMPS" FOR Y STRAINER OPTION

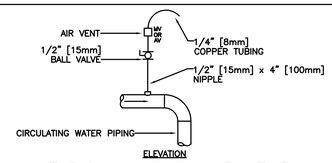
5 SINGLE SUCTION FLOOR–MOUNTED PUMPS – CONNECTIONS WITH FLEXIBLE CONNECTORS
NTS

DESIGNER'S NOTE:
CHECK VALVE IS OPTIONAL FOR SINGLE PUMP, EXCEPT FOR COOLING TOWER PUMP.



TYPICAL CHILLED AND HOT WATER PIPING DRAIN VALVE CONNECTIONS

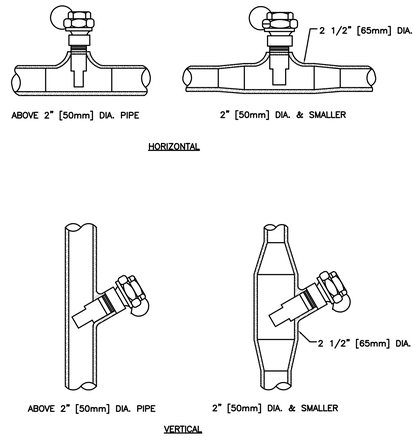
NOTES:
1. DRAIN ALL LOW POINTS AS INDICATED ABOVE.
2. WHERE SCALE POCKETS ARE SHOWN ON PIPE RISER DIAGRAMS AND/OR PLANS LOCATE DRAIN AT BOTTOM OF SCALE POCKET.



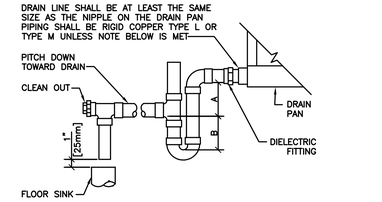
TYPICAL MANUAL AIR VENT

NOTES:
1. VENT ALL HIGH POINTS INDICATED ABOVE.
2. IF AUTOMATIC AIR VENTS ARE USED, PIPE DISCHARGE TO DRAIN.

4 DRAIN VALVE AND AIR VENT CONNECTIONS (HYDRONIC SYSTEMS)
NTS



3 INSTALLATION OF THERMOMETER WELLS
NTS

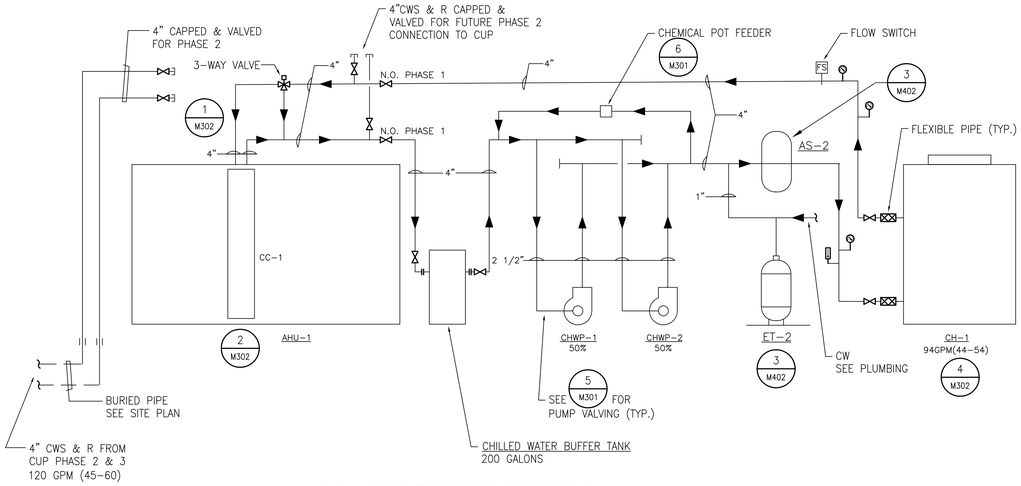


NOTE: 1. CPVC PIPE MAY BE USED ONLY IF APPROVED BY LOCAL VA AND IS INDOORS AND DOES NOT PASS THROUGH RATED BARRIERS.
2. DIELECTRIC FITTING TO BE USED WHEN TWO DISSIMILAR METALS ARE TO BE CONNECTED.

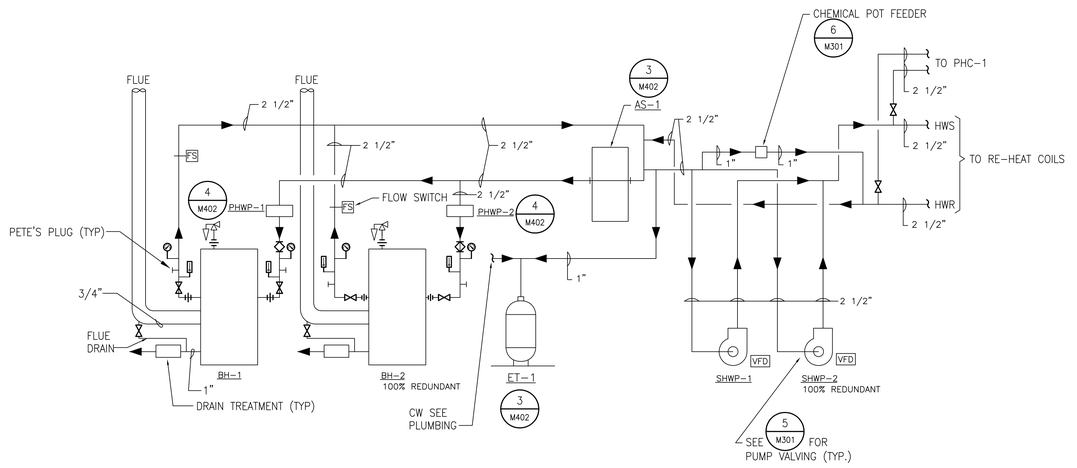
UNIT TYPE	A	B
DRAW THRU	2" [50mm] PLUS X	X
BLOW THRU	1" [25mm] MINIMUM	2X

WHERE X = STATIC PRESSURE IN PAN

2 AIR HANDLING UNIT DRAIN TRAP DETAIL
NTS



7 CHILLER PIPING DIAGRAM
NTS



1 BOILER PIPING DIAGRAM
NTS

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions:	Date

CONSULTANTS:

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Drawing Title: AIR FLOW AND PIPING DIAGRAMS
Approved: Project Director

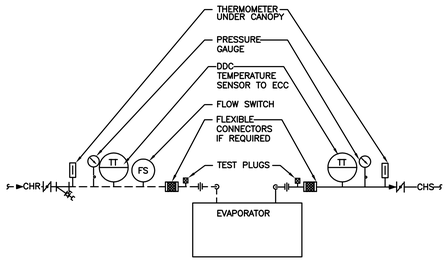
Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1
Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

Project Number: 570-218
Building Number: 31
Drawing Number: M301
Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08–6231



NOTE:

1. PROVIDE HEAT TRACING WHEN THE EXPOSED PIPING CARRYING CHILLED WATER IS NOT MIXED WITH PROPYLENE CLYCOL. ALL VALVES, STRAINER, FLOW SWITCH, FLEXIBLE CONNECTORS, ETC., SHALL BE WRAPPED WITH ELECTRIC HEAT TRACE CABLE UNDER INSULATION.
2. VERIFY NEED FOR FLEXIBLE CONNECTOR.
3. PROVIDE ALUMINUM JACKETING ON ALL EXPOSED, INSULATED PIPING.

4 AIR COOLED CHILLER - PIPING CONNECTIONS

NTS

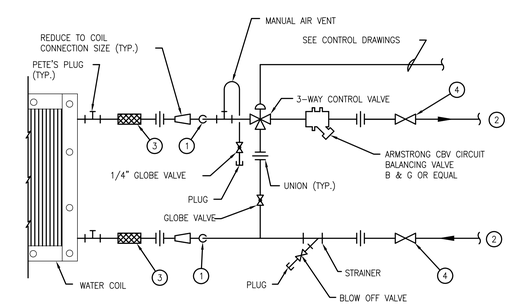
JOB: 0555.09
BUILDING: VA SAMPLE POINTS LIST

PAGE:

SYSTEM: VAV AIR HANDLER SYSTEM COMPONENT:	POINT ID	ABBREVIATION	POINT LEGEND: SPARE / ADJ. ALLOWANCE; EXISTING DEVICE; DEMOLISH; SYSTEM OUTPUTS: BINARY: BINARY OUTPUT (ON/OFF); ANALOG: ANALOG OUTPUT (MODULATING); SYSTEM INPUTS: BINARY: BINARY INPUT (ON/OFF); ANALOG: TEMPERATURE (RTD); TEMPERATURE (T); PRESSURE (DIFFERENTIAL); PRESSURE (STATIC); HUMIDITY; CURRENT (AMPS); VOLTAGE; LEVEL (Ultrasonic); LEVEL (Float); FLOW (Pressure); FLOW (Thermal); SYSTEM SOFTWARE/CONTROL: ALARM PROCESSING: SYSTEM ERROR/STOP; APPLICATION/FUNCTION: TEMPERATURE CONTROL; HUMIDITY CONTROL; PRESSURE CONTROL; FLOW CONTROL; LEVEL CONTROL; PROGRAMMING; TIME SCHEDULING; TRENDING; DEMAND LIMITING; OPTIMUM START/STOP; ENERGY CALCULATIONS;	REMARKS
Return air Temperature	AI-1	RAT	
Return Air Humidity	AI-2	RAH	
Return Air Flow (cfm)	AI-3	RAF	
Mixed Air Temperature	AI-4	MAT	
Pre-Heat Temperature	AI-5	PHT	
Cooiling Coil Temperature	AI-6	CCT	
Discharge Air Temperature	AI-7	DAT	
Discharge Static Pressure	AI-8	DASP	
Discharge Air Humidity	AI-9	DAH	
Supply Air Flow (cfm)	AI-10	SAF	
OUTSIDE AIR TEMPERATURE	AI-11	OAT	
RETURN LOW PRESSURE	BI-1	RLP	
RETURN FAN STATUS	BI-2	RF-STS	
SUPPLY FAN STATUS	BI-3	SF-STS	
MIXED AIR LOW LIMIT	BI-4	TSL-1	
STATIC PRESSURE HIGH LIMIT	BI-5	SPS-2	
HUMIDITY HIGH LIMIT	BI-6	HHL	
SUPPLY FAN VSMC ALARM	BI-7	SF-ALA	
RETURN FAN VSMC ALARM	BI-8	RF-ALA	
RETURN FAN VSMC	AO-1	RF-SPD	FULL COMMUNICATION
SUPPLY FAN VSMC	AO-2	SF-SPD	FULL COMMUNICATION
OUTSIDE AIR DAMPER	AO-3	OAD	
RETURN AIR DAMPER	AO-4	RAD	
EXHAUST AIR DAMPER	AO-5	EAD	
MINIMUM OUTSIDE AIR DAMPER	AO-7	MIN-OAD	
PRE-HEAT VALVE V-2	AO-8	PHT-V1	
COILING VALVE V-1	AO-9	CLG-V1	
STEAM HUMIDIFIER VALVE V-4	AO-10	HUM-V4	
RETURN FAN START/STOP	BO-1	RF-SST	
SUPPLY FAN START/STOP	BO-2	SF-SST	
STEAM ISOLATION VALVE V-3	BO-3	HUM-ISO-V3	

3 POINTS LIST FOR VAV AIR HANDLING UNIT WITH MINIMUM OUTSIDE AIR

NTS



NOTES:

1. OFFSET PIPING AT AIR HANDLING UNIT(S) THAT COILS(S) CAN BE REMOVED FROM AHU CASING AND SO THAT PIPING DOES NOT BLOCK ACCESS DOORS, ETC.
2. SEE PLAN DRAWING FOR PIPE SIZES.
3. FLEXIBLE CONNECTION.
4. ISOLATION VALVE – SEE SPECIFICATIONS.

5 COIL CONNECTION THREE WAY VALVE

NO SCALE

SEQUENCE OF OPERATION FOR VARIABLE AIR VOLUME AIR HANDLING UNIT WITH MINIMUM OUTSIDE AIR

1. GENERAL

1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1, D-3, SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1, SD-1 AND SD-2 SHALL BE FULLY OPEN. D-2 AND D-3 SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

2.1 SUPPLY AIR TEMPERATURE, SENSED BY TT-1, SHALL BE MAINTAINED AT SETPOINT VIA DIGITAL CONTROL PANEL BY MODULATING V-1 OR D-2 AND D-3 OR V-2 IN SEQUENCE.

2.2 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS ABOVE 75'F (ADJ) [23.8'C], THE DIGITAL CONTROL PANEL SHALL PREVENT THE MODULATION OF D-2 AND D-3 AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION (D-2 FULLY OPENED AND D-3 FULLY CLOSED). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.

2.3 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BETWEEN 65'F [18.3'C] AND THE SUPPLY AIR TEMPERATURE SENSED BY TT-1, DAMPER D-2 SHALL FULLY CLOSE AND D1 AND D3 SHALL BE FULLY OPEN (MAXIMUM OUTSIDE AIR POSITION). THE DIGITAL CONTROL PANEL SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.

2.4 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY TT-2, IS BELOW THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1, DAMPERS D1, D-2 AND D-3 SHALL MODULATE TO MAINTAIN THE SCHEDULED SUPPLY AIR TEMPERATURE. IF D-2 IS OPEN AND D-3 IS CLOSED TO MINIMUM OUTSIDE AIR, V-2 SHALL MODULATE OPEN TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY TT-1.

3. AIR FLOW CONTROL

3.1 THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 1.0" [25mm] OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY SPS-1. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL ATU

3.2 THE DIGITAL CONTROL PANEL, USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VSMC TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.

3.3 USING HIGH PRESSURE SENSOR SPS-2 LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 3" [75mm] OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-2 DOES EXCEED 3" [75mm] THE SUPPLY AIR FAN SHALL STOP. SPS-2 SHALL BE HARDWIRED TO THE SUPPLY FAN VSMC AND UNIT SHALL BE SHUTDOWN IN HAND,AUTO OR BYPASS MODE. SPS-2 WILL REQUIRE MANUAL RESET AT THE DEVICE.

4. HUMIDITY CONTROL

4.1 WHEN THE DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY RETURN AIR HUMIDITY H-1, 2-WAY "ON-OFF" CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-3 SHALL REMAIN OPEN.

4.2 RETURN AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 35% RH (ADJ) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-4 TO MAINTAIN THE DESIRED HUMIDITY. THE DCP SHALL OVERRIDE THIS CONTROL TO MAINTAIN HUMIDITY OF 80% AS SENSED BY H-2. DCP SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-4 SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE.

5. FREEZE PROTECTION

5.1 IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45'F [7'C], AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE FALLS BELOW 40'F [4.4'C], AS SENSED BY THE TSL THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN UFD AND UNIT SHALL BE SHUTDOWN IN HAND,AUTO OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

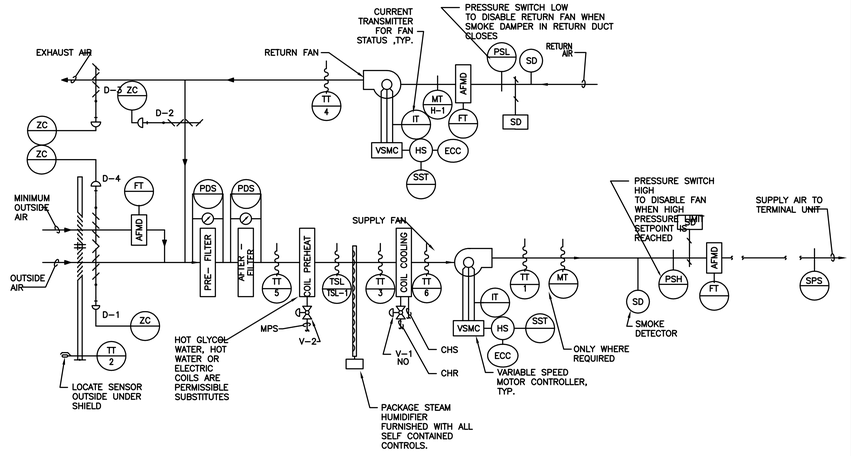
6. AUTOMATIC SHUTDOWN/RESTART

6.1 WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, SD, THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. ALL SMOKE DAMPERS IN THE SUPPLY AND RETURN DUCTS SHALL CLOSE.

6.2 EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

7. EMERGENCY CONSTANT SPEED OPERATION

7.1 UPON FAILURE OF THE VSMC, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.



2 VARIABLE AIR VOLUME AIR HANDLING UNIT WITH MINIMUM OUTSIDE AIR CONTROL DIAGRAM

NTS

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions:	Date

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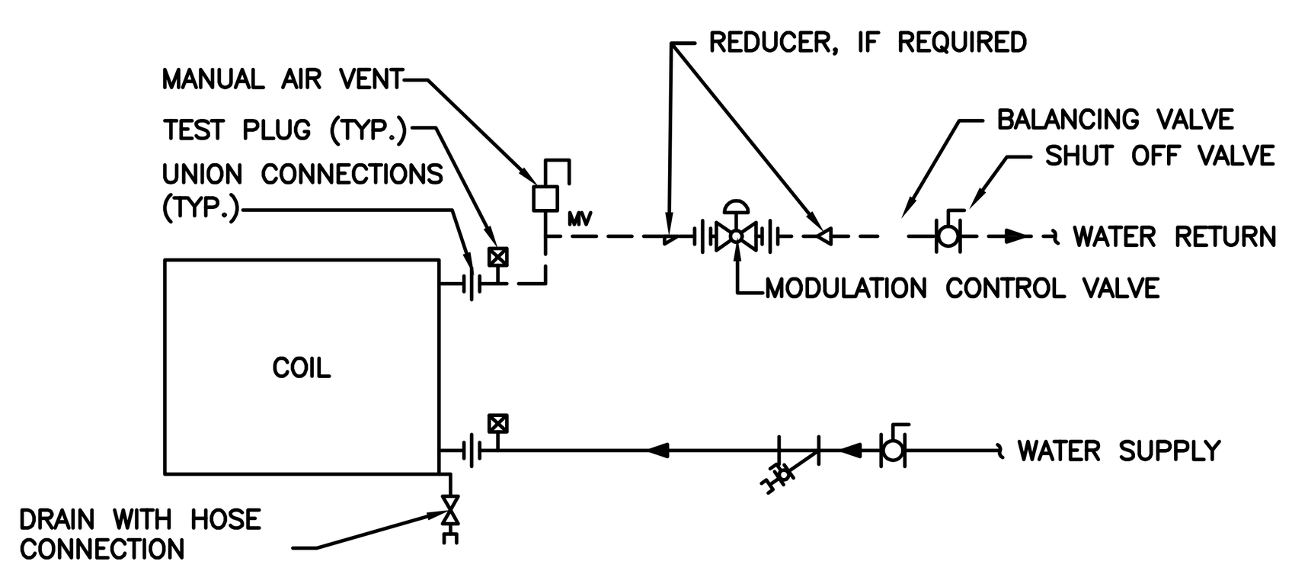
Drawing Title: CONTROL DIAGRAMS
Approved: Project Director

Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1
Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date: OCTOBER 29, 2015 | Checked: MT | Drawn: NS/GL

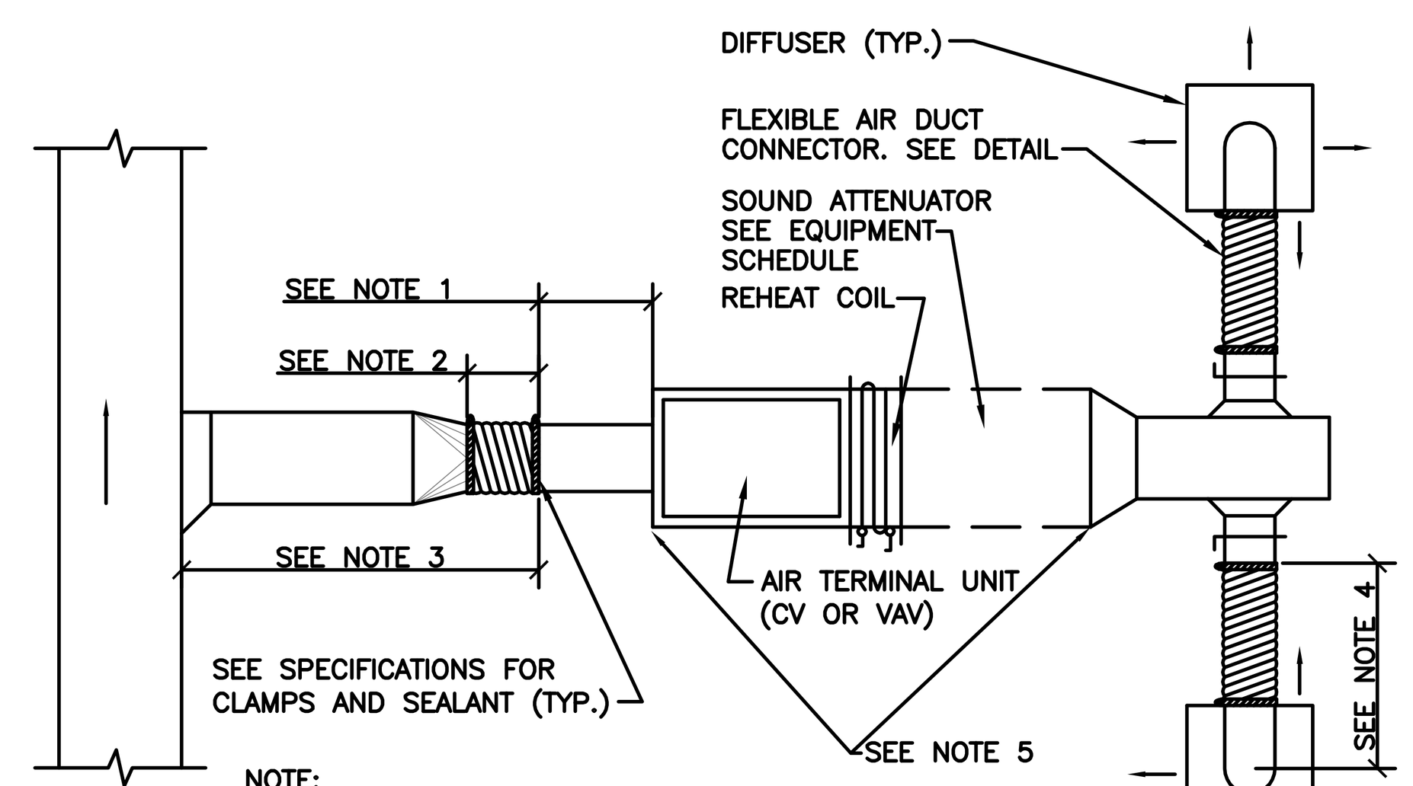
Project Number: 570-218
Building Number: 31
Drawing Number: M302
Dwg. of

Office of Construction and Facilities Management
Department of Veterans Affairs



1 TERMINAL UNIT WATER COILS - PIPING CONNECTIONS

NTS

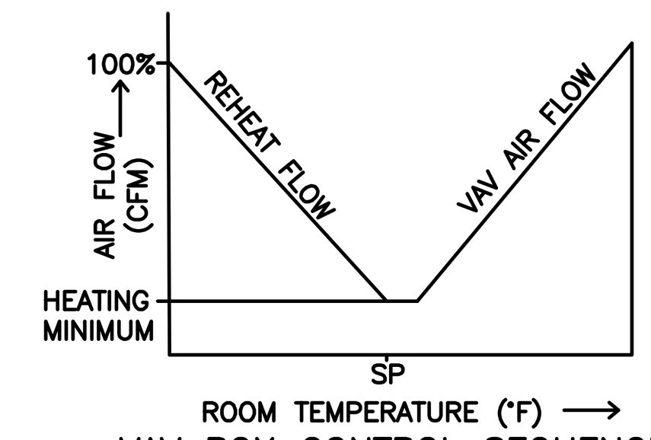


NOTE:

1. RIGID STRAIGHT TERMINAL UNIT INLET LENGTH SHALL BE A MINIMUM OF 3 TIMES THE DIAMETER OF INLET
2. A FLEXIBLE AIR DUCT CONNECTOR IS NOT MANDATORY FOR INLET TO THIS BOX, BUT ALLOWED TO ACCOMMODATE MINOR OFFSETS. MAXIMUM LENGTH 3'-0" [900mm].
3. A BRANCH DUCT SERVING AN INDIVIDUAL BOX MAY BE THE SAME SIZE AS THE BOX INLET, PROVIDED THE EQUIVALENT LENGTH OF THE BRANCH DUCT, AS SHOWN, DOES NOT EXCEED 10 FEET (3 METERS). FOR LONGER LENGTHS, INCREASE THE DUCT SIZE AND PROVIDE A DUCT TRANSITION TO MAINTAIN THE DUCT STATIC PRESSURE DROP AT OR BELOW 0.2"/100' [1.64Pa/m].
4. FLEXIBLE AIR DUCT CONNECTORS, WHEN USED FROM TERMINAL UNIT SUPPLY AIR DUCT TO DIFFUSER, SHALL NOT EXCEED 5'-0" [1500mm]. USE RIGID ELBOWS FOR CHANGE OF DIRECTION GREATER THAN 45°.
5. COMPONENT ARRANGEMENT MAY VARY BY MANUFACTURER. PROVIDE INSULATION W/VAPOR BARRIER FOR CONNECTING DUCT SECTIONS.
6. USE OF THE FLEXIBLE AIR DUCT CONNECTORS ARE NOT PERMITTED FOR THE DEDICATED AHU SERVING THE SURGICAL SUITE.

2 DUCT CONNECTIONS - AIR TERMINAL UNITS

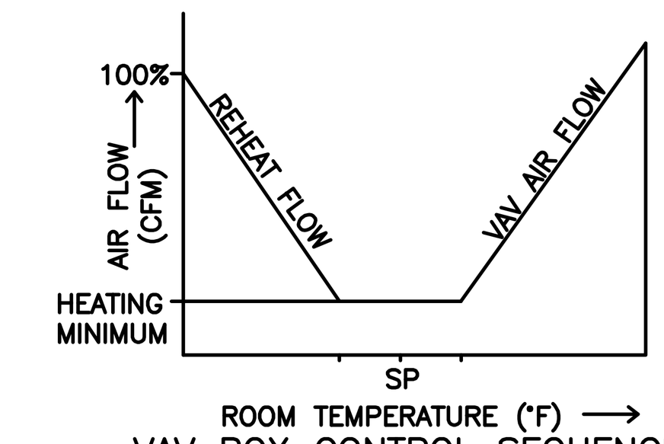
NTS



VAV BOX CONTROL SEQUENCE

NO DEADBAND

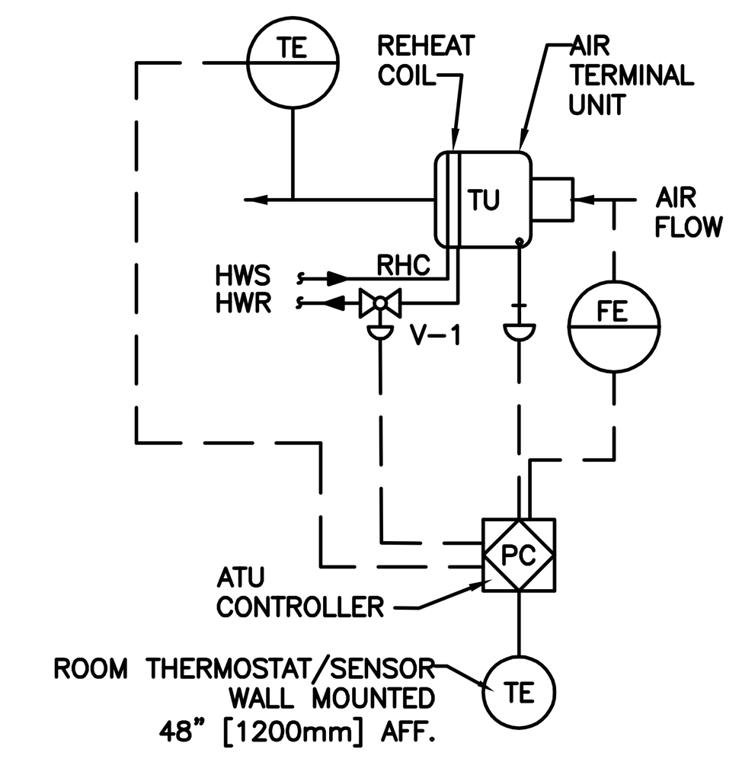
A. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.
B. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT ± .5° F. THE ADJUSTABLE TOLERANCE OF ± .5° F HAS BEEN SELECTED TO PREVENT VALVE HUNTING
C. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.



VAV BOX CONTROL SEQUENCE

W/DEADBAND

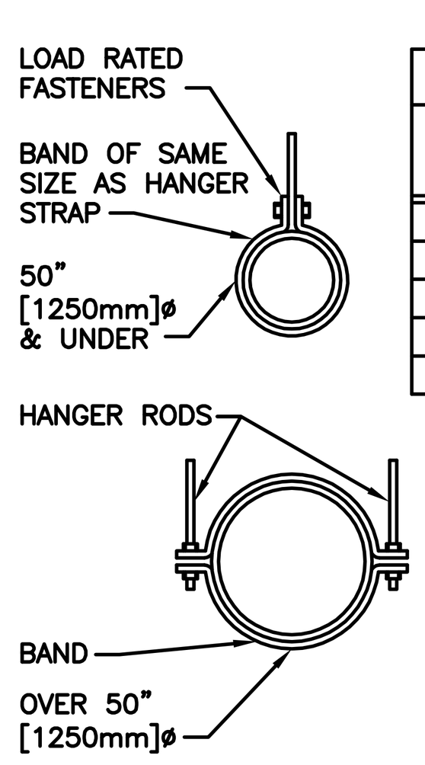
A. SET POINTS SHALL BE SET AS FOLLOWS:
   COOLING 75°F (ADJ)
   HEATING 70°F(ADJ)
   DEADBAND OF 5° F BETWEEN HEATING AND COOLING SET POINTS WILL BE MAINTAINED.
B. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.
C. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT ± .5° F. THE ADJUSTABLE TOLERANCE OF ± .5° F HAS BEEN SELECTED TO PREVENT VALVE HUNTING
D. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.



NO SUPPLEMENTAL HEATING

3 VARIABLE VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM

NTS



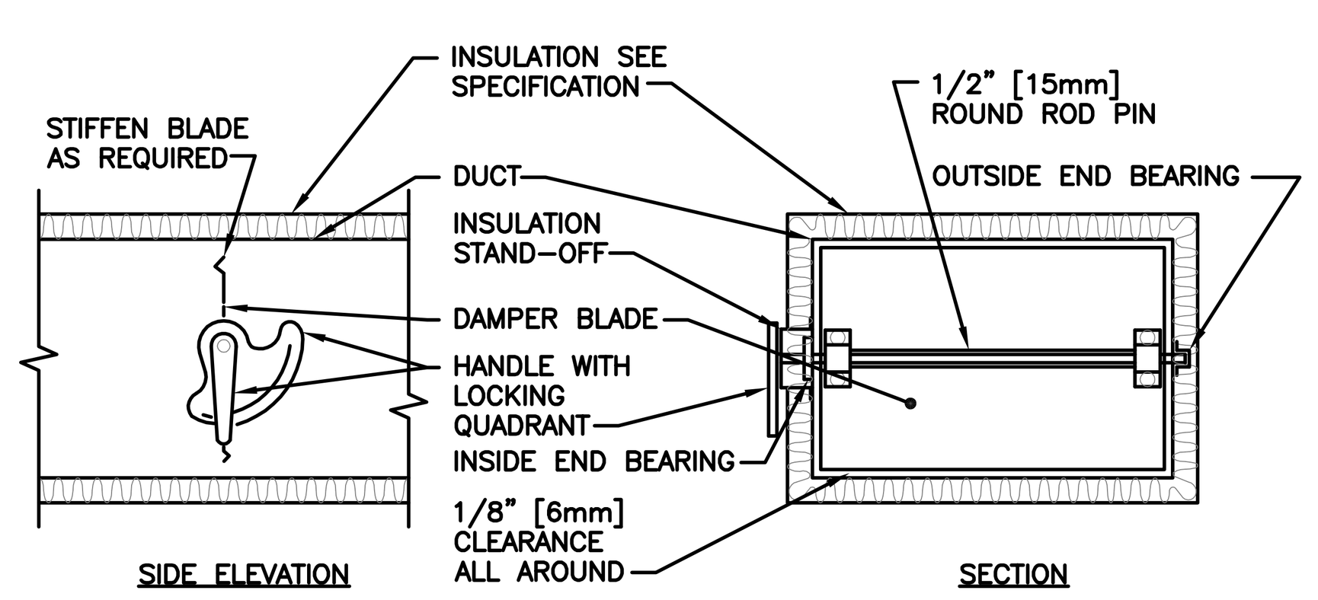
HANGER STRAPS OR RODS

MAX. DUCT ø IN. [mm]	QUANTITY/SIZE IN. [mm]	MAX. LOAD LBS. [kg]	MAX. SPACING IN. [mm]
26 [650]	ONE 1 [25] x 22 GA STRAP	260 [119]	144 [3600]
36 [900]	ONE 1 [25] x 18 GA STRAP	420 [190]	144 [3600]
50 [1250]	ONE 1 [25] x 16 GA STRAP	700 [317]	144 [3600]
60 [1500]	TWO 3/8 [10]ø. RODS	1320 [598]	144 [3600]
84 [2100]	TWO 1/2 [13]ø RODS	2500 [1133]	144 [3600]

NOTE:
TABULATED DATA FROM SMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

4 ROUND DUCT HANGERS

NTS

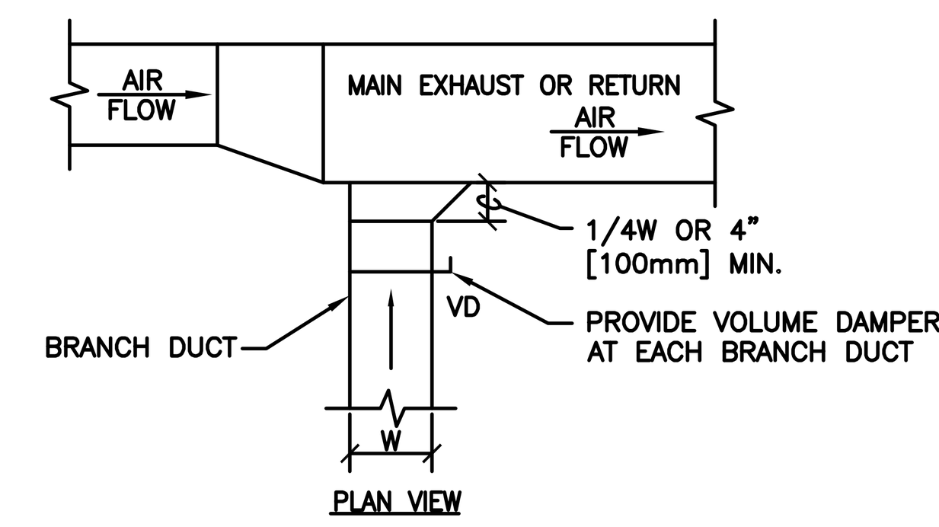


NOTE:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

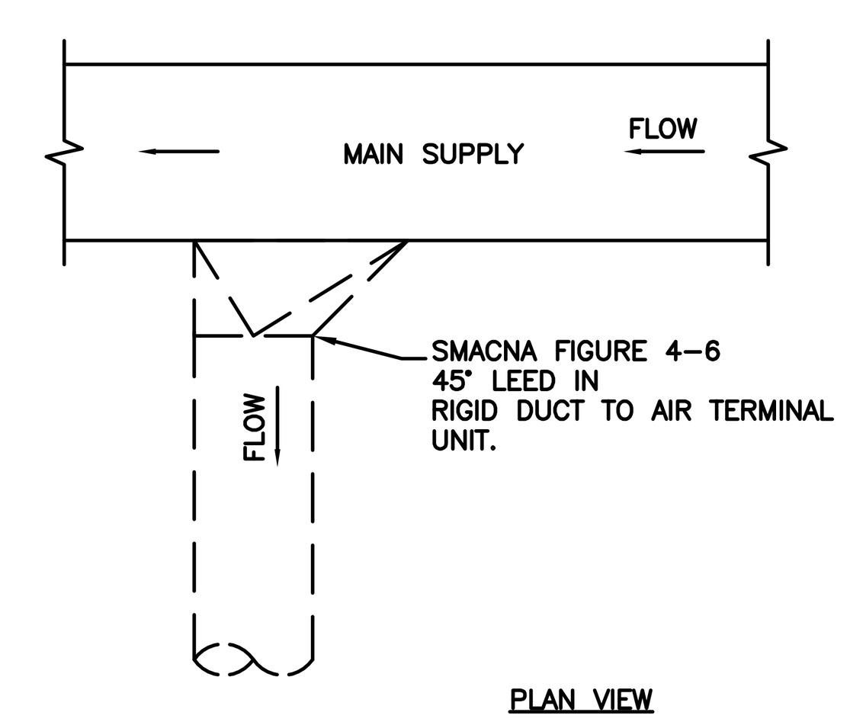
5 VOLUME DAMPER DETAIL

NTS



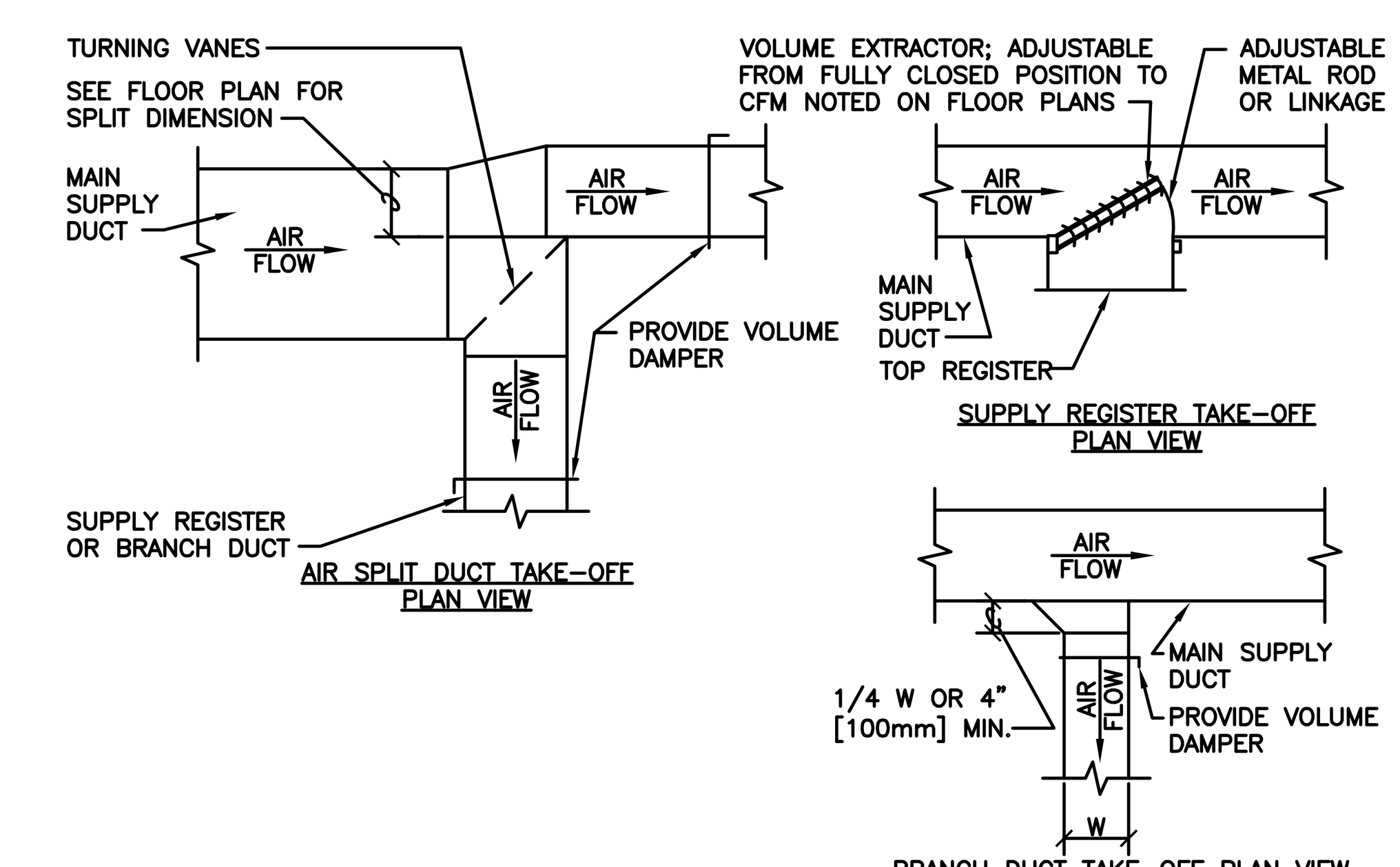
6 EXHAUST OR RETURN BRANCH DUCTWORK

NTS



7 ALTERNATE SUPPLY DUCT TAKEOFF - AIR TERMINAL UNITS

NTS



8 SUPPLY DUCTWORK TAKE-OFFS

NTS

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions:	Date

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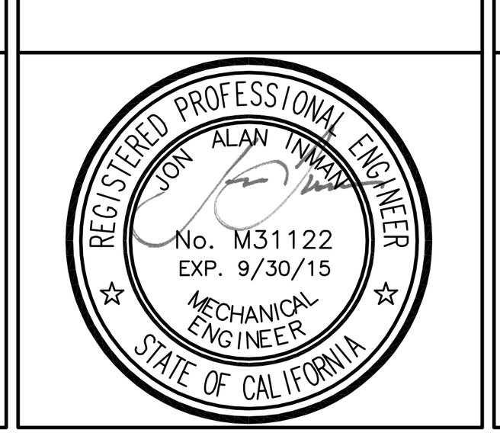
Project Number: 120-099



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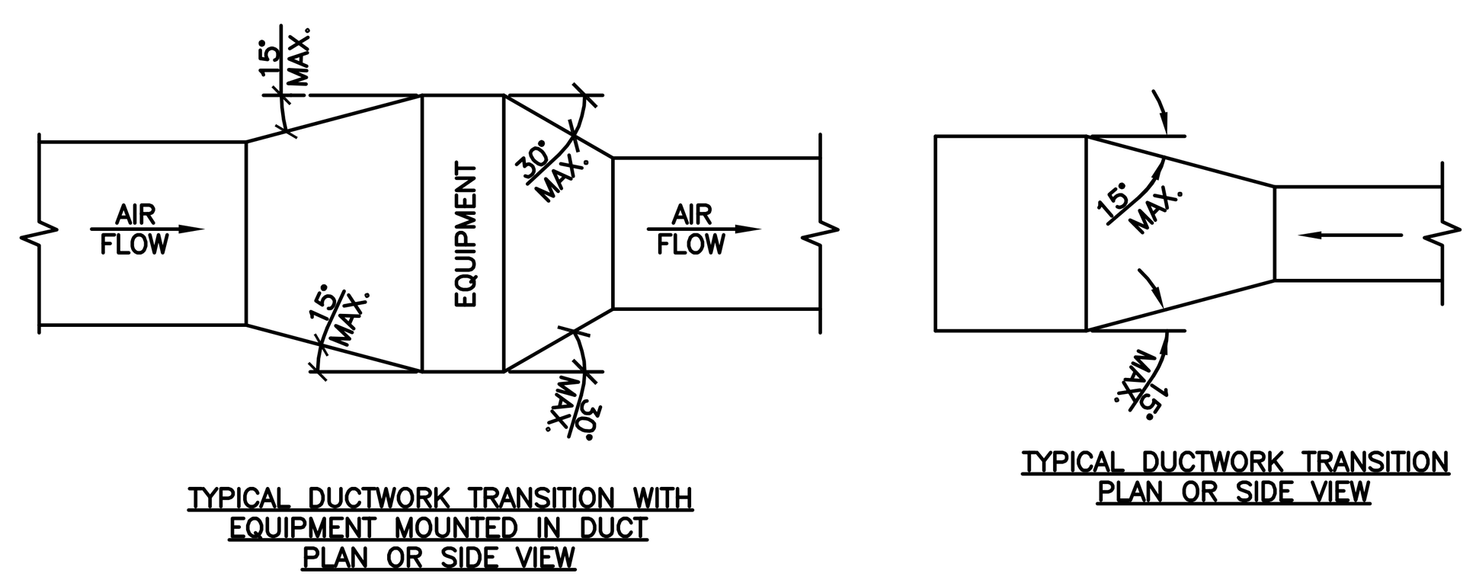
Drawing Title	MECHANICAL DETAILS
Approved: Project Director	
Project Title	EXPAND COMMUNITY LIVING CENTER PHASE 1
Location	2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date	OCTOBER 29, 2015
Checked	MT
Drawn	NS/GL
Project Number	570-218
Building Number	31
Drawing Number	M401

Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs



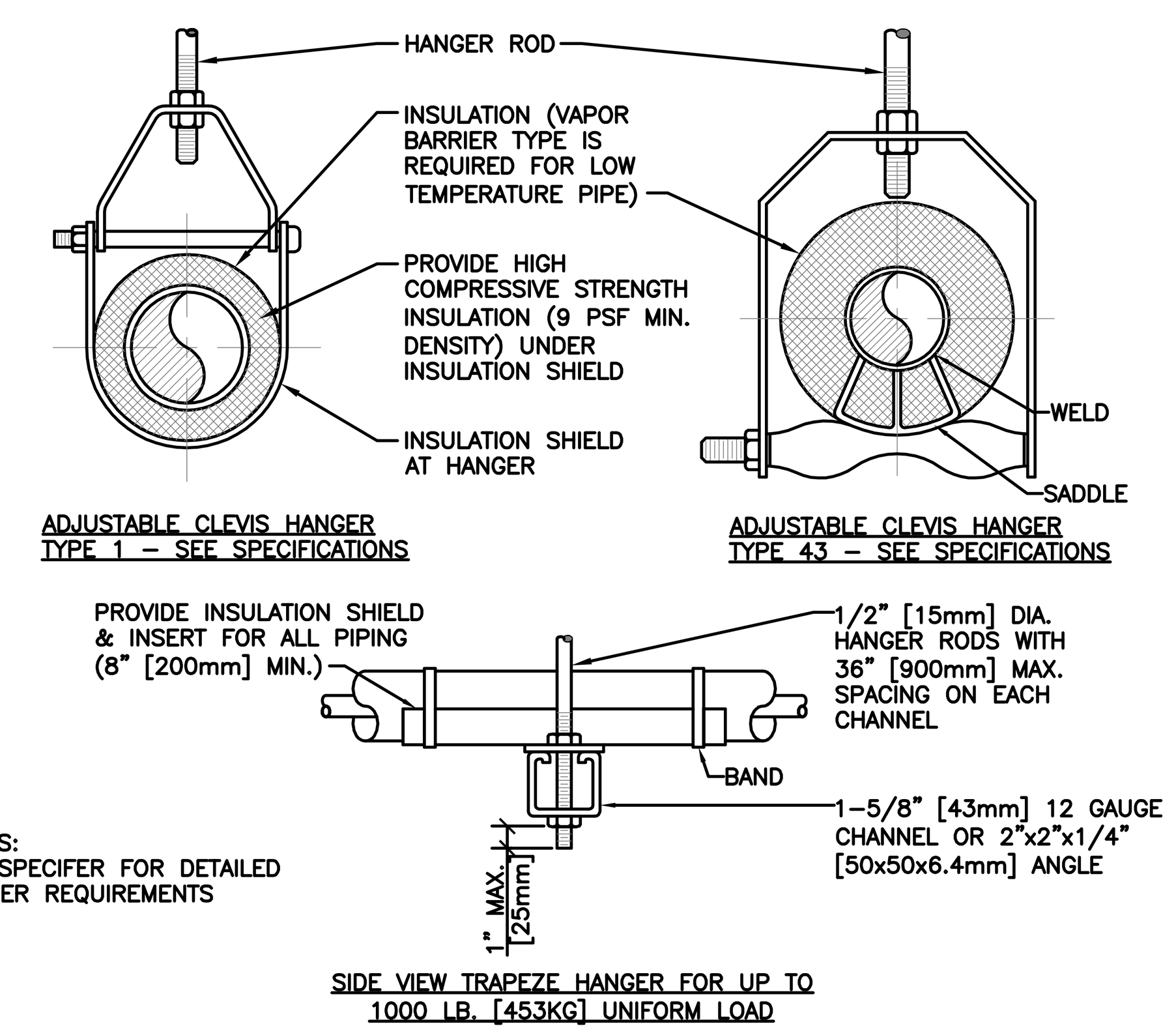
TYPICAL DUCTWORK TRANSITION WITH EQUIPMENT MOUNTED IN DUCT
PLAN OR SIDE VIEW

TYPICAL DUCTWORK TRANSITION
PLAN OR SIDE VIEW

NOTE:
UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

1 DUCTWORK TRANSITIONS (WITH EQUIPMENT MOUNTED IN DUCT)

NTS



NOTES:
SEE SPECIFER FOR DETAILED HANGER REQUIREMENTS

SIDE VIEW TRAPEZE HANGER FOR UP TO 1000 LB. [453KG] UNIFORM LOAD

MAXIMUM PIPE/TUBING SUPPORT SPACING

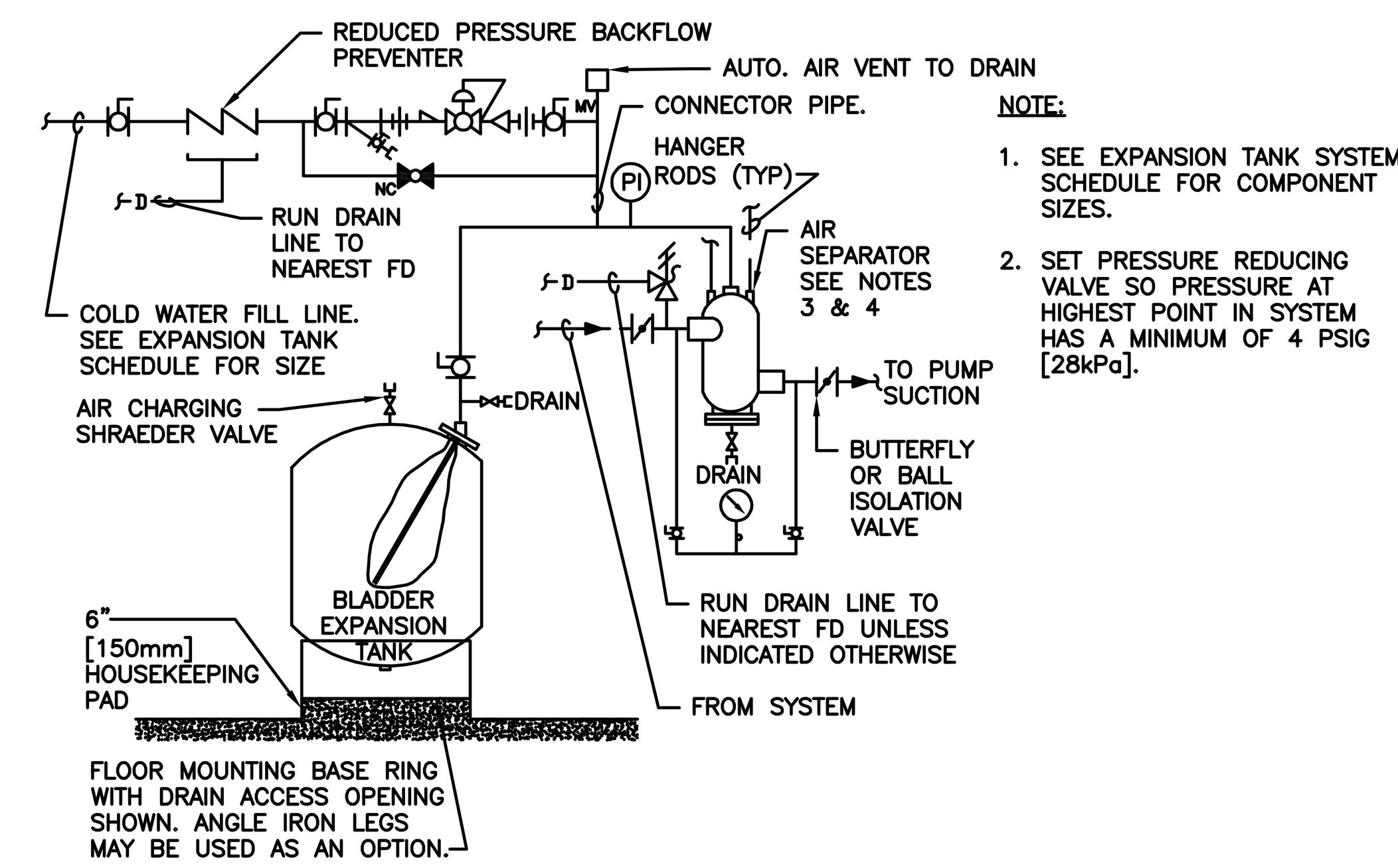
NOM. SIZE IN. [mm]	THRU 3/4 THRU [20]	1 [25]	1 1/4 [32]	1 1/2 [40]	2 [50]	2 1/2 [65]	3 [75]	4 [100]	5 [125]	6 [150]	8 [200]	10 [250]	12 [300]	14 [350]	16 [400]	18 [450]	20 [500]	24 [600]
PIPE FT. [mm]	7 [2100]	7 [2100]	7 [2100]	9 [2700]	10 [3000]	11 [3400]	12 [3700]	14 [4100]	16 [4900]	17 [5200]	19 [5800]	22 [6700]	23 [7000]	25 [7600]	27 [8200]	28 [8500]	30 [9100]	32 [9600]
TUBING FT. [mm]	5 FT [1500]	6 [1800]	7 [2100]	8 [2400]	8 [2400]	9 [2700]	10 [3000]	12 [3700]	13 [4000]	14 [4100]	16 [4900]	–	–	–	–	–	–	–

NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.

2 PIPE HANGERS

NTS

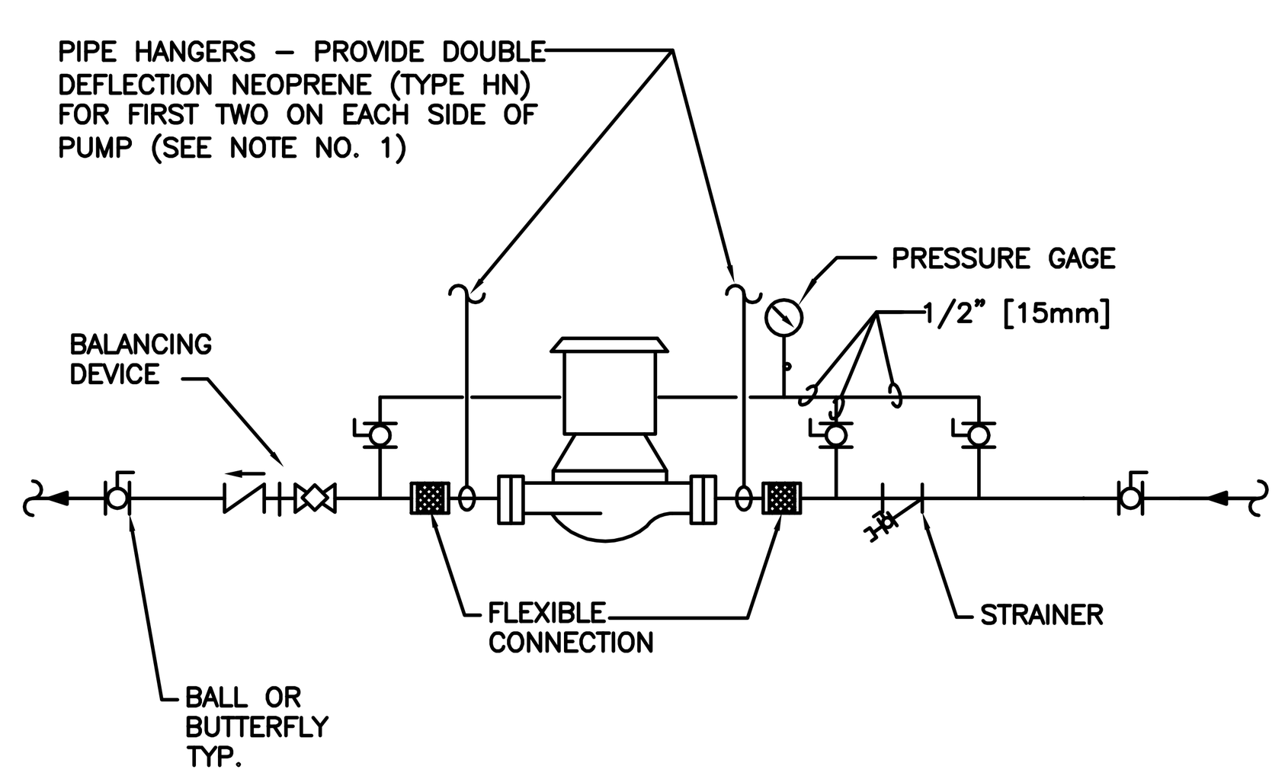
DESIGNER'S NOTE:
SHOW ON THE DRAWINGS OTHER SPECIFIED AND SPECIAL PIPE SUPPORTS WHERE REQUIRED.



NOTE:
1. SEE EXPANSION TANK SYSTEM SCHEDULE FOR COMPONENT SIZES.
2. SET PRESSURE REDUCING VALVE SO PRESSURE AT HIGHEST POINT IN SYSTEM HAS A MINIMUM OF 4 PSIG [28kPa].

3 FLOOR MOUNTED EXPANSION TANK - PIPING CONNECTIONS

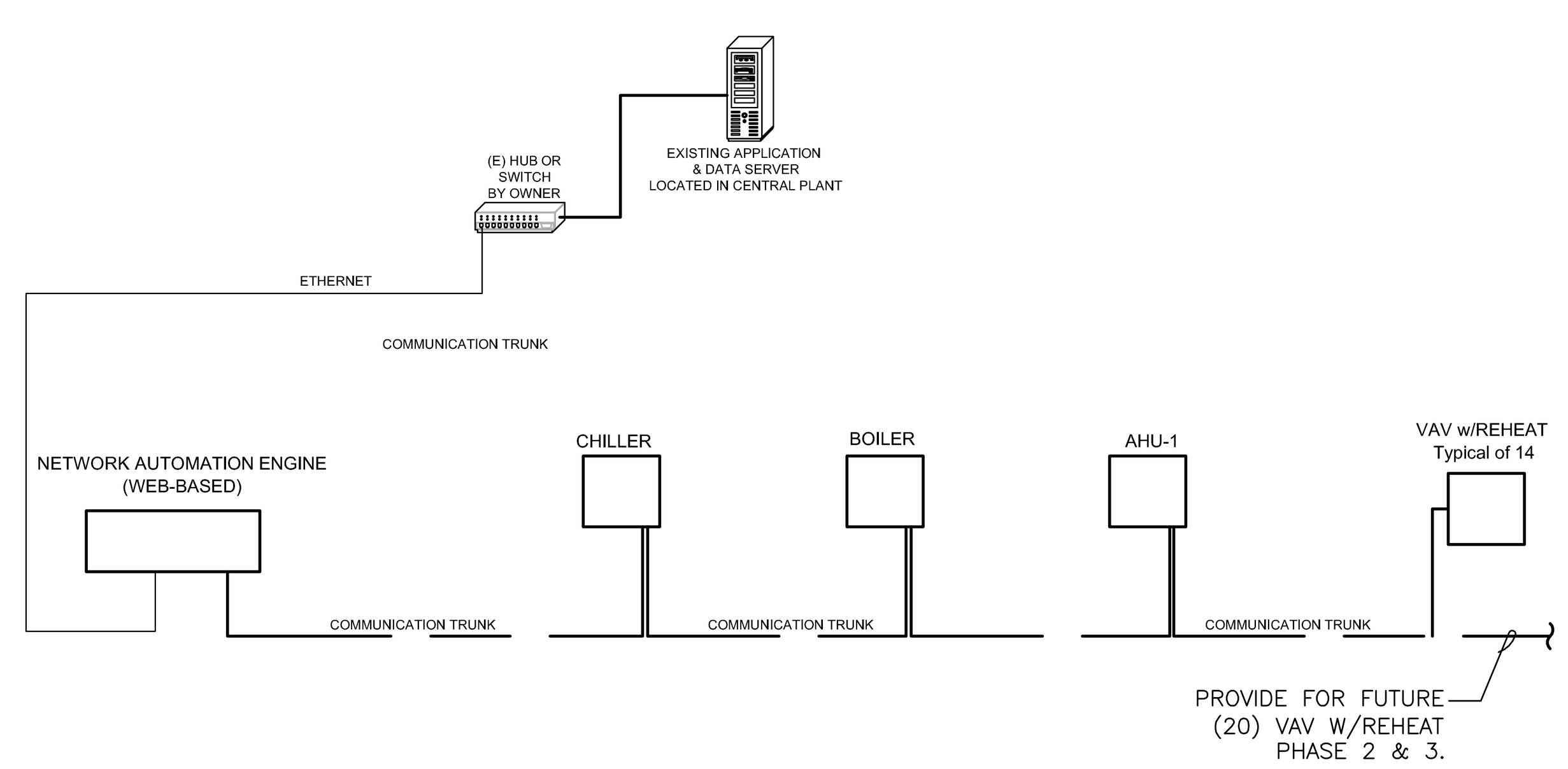
NTS



NOTES:
1. SUPPORT PUMP FROM PIPING ONLY. DO NOT SUPPORT PUMP FROM MOTOR.

4 IN-LINE PUMPS - CONNECTIONS

NTS



5 BMC DIAGRAM

NTS

100% CONSTRUCTION DOCUMENTS
NOVEMBER 19, 2015

Revisions:	Date

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Drawing Title: MECHANICAL DETAILS
Approved: Project Director
Project Title: EXPAND COMMUNITY LIVING CENTER PHASE 1
Location: 2615 E. CLINTON AVE. FRESNO, CA 93703-2223
Date: OCTOBER 29, 2015
Checked: MT
Drawn: NS/GL
Project Number: 570-218
Building Number: 31
Drawing Number: M402
Dwg. of

Office of Construction and Facilities Management
Department of Veterans Affairs